Experimental Study on the Impact of the

6+1 Trait®
Writing Model

on Student Achievement in Writing

This report is part of a series from NWREL to assist in school improvement. Publications are available in five areas:

Re-engineering

Assists schools, districts, and communities in reshaping rules, roles, structures, and relationships to build capacity for long-term improvement

Quality Teaching and Learning

Provides resources and strategies for teachers to improve curriculum, instruction, and assessment by promoting professional learning through reflective, collegial inquiry

School, Family, and Community Partnerships

Promotes child and youth success by working with schools to build culturally responsive partnerships with families and communities

Language and Literacy

Assists educators in understanding the complex nature of literacy development and identifying multiple ways to engage students in literacy learning that result in highly proficient readers, writers, and speakers

Assessment

Helps schools identify, interpret, and use data to guide planning and accountability

Experimental Study on the Impact of the 6+1 Trait® Writing Model on Student Achievement in Writing

Michael Kozlow
Peter Bellamy

December 2004

Contents

Tables

PREFACE

Purpose

This report presents the results of a study that examined the efficacy of professional development for teachers using the 6+1 Trait® Writing model with respect to improving student writing skills. To achieve this purpose, a randomized experimental study was conducted in 2003–2004 in grades 4 to 6 to determine the extent to which a two-day workshop on the 6+1 Trait® Writing model affected teacher practices and student achievement in writing. The study examined fidelity of implementation through a teacher survey on classroom practices to determine the extent to which teachers implemented the desired strategies and to describe differences between classroom practices of teachers in the treatment group and those of teachers in the control group. Student achievement in writing was measured by having students write on assigned prompts to produce narrative, descriptive, or persuasive pieces of writing.

Rationale

The need for research on improving writing instruction and students' writing skills is exemplified by results of the most recent national writing assessment and the limited amount of available research connecting professional development to improved student achievement in writing. The 2002 National Assessment of Educational Progress results in writing showed that the percent of students achieving at the proficient level or better was only 28 percent in grade 4, 31 percent in grade 8, and 24 percent in grade 12 (Persky, et al., 2003). Increases in these percentages between 1998 and 2002 were small at all grade levels. These assessment results raise special concerns because writing is a critical life skill and writing also supports the development of reading and thinking skills.

The importance of professional development for improving teacher quality (and, by implication, student achievement), suggests that the efficacy of teacher professional development is critical to improving student learning. However, there is a limited amount of research on the impact of professional development on student achievement and much of the available research has been conducted in science and mathematics education (Guskey, 2003). This study contributes to the educational research knowledge in two key areas related to the above issue. It examined the effectiveness of (1) specific strategies that integrate assessment and instruction for improving students' writing skills, and (2) a professional development package designed to help teachers effectively implement those strategies.

The traits-based approach to writing was developed in the mid-1980s in response to teachers' needs for an assessment tool that was closely linked to effective writing instruction. It drew upon the research on process writing and the emergence of the use of

traits to define quality writing. The 6+1 Trait® Writing model is an example of a traits-based approach that integrates instruction and assessment and provides a wide range of specific strategies and materials for teachers to use in teaching writing in their language arts programs. It is supported by professional development designed to build teacher understanding of these strategies and teacher knowledge of the characteristics of quality writing, and to improve teachers' skills in implementing these strategies to help students write more effectively. The specific strategies incorporated into this model are supported by the research in the following four areas: process writing, a focus on traits of writing, peer groups, and the use of formative assessment to improve student learning.

Design

This experimental study on the impact of training on the 6+1 Trait® Writing model was designed to answer the following two research questions:

1. To what extent will teachers in grades 3 to 6 implement the strategies presented in the 6+1 Trait® Writing model following a two-day training session?
2. Following the implementation of the intervention, will the quality of writing produced by students in the treatment group be higher than that produced by students in the control group?

These research questions reflect the underlying causal model that good professional development first elicits change in teacher practices that subsequently leads to more effective student learning and to higher levels of student achievement. The first question addresses the fidelity of implementation of the intervention, and the second question addresses the impact of the intervention on student achievement. The main data collection instruments were a teacher survey and an assessment of writing performance.

The research question on student achievement was examined independently at four grade levels (grades 3, 4, 5, and 6). The study employed an experimental design with one treatment factor consisting of a treatment group and a control group, and with repeated measures on the dependent student achievement variables. All students in the treatment and control groups submitted two pieces of writing, one in the fall before the teacher training and one at the end of the school year. The teacher survey was administered at the end of the school year.

Teachers in the treatment group received two days of training in 6+1 Trait® Writing in November 2003 and they were asked to use the model in teaching writing for the remainder of the school year. Teachers in the control group were asked to teach writing in the way that they had in the past. They were asked not to access resources on the 6+1 Trait® Writing model from other teachers in their school, and not to discuss this model with teachers in the treatment group.

Application

The 6+1 Trait® Writing model has been designed to help teachers teach and assess student writing through an analytic approach by focusing on the following seven traits that characterize quality writing: Ideas, Organization, Voice, Word Choice, Sentence Fluency, Conventions, and Presentation. The training in 6+1 Trait® Writing instructs teachers in the use of these traits to evaluate student writing and to plan and deliver instruction. Language is provided to help students understand how the traits are reflected in good writing and to use this understanding to improve their own writing. This is strengthened through the use of rubrics and samples of student writing to illustrate these traits.

Both the classroom intervention (6+1 Trait® Writing model) and the professional development package are currently in wide use across the United States and in other countries. A number of products to support the 6+1 Trait® Writing model have been produced and are used extensively by classroom teachers.

ACKNOWLEDGMENTS

We thank our colleagues Michael Coe and Makoto Hanita for their critical work in designing and conducting the statistical analyses using the linear mixed model, and Matt Lewis for his detailed work in data cleaning and data analysis.

We thank the NWREL scoring center staff for their reliable scoring of the more than 3,000 student papers: Delane Munson, Sandra Marek, and the pool of raters. Delane Munson also conducted the analysis for the inter-rater reliability and assisted in the analysis of the teacher comments.

A special thank-you goes to the students and teachers of Baldwinsville Central School District for their participation in the study and to the district staff for their logistical support.

We would like to acknowledge the important work of Matthew Whitaker, Kathy Petersen, Denise Jarrett-Weeks, Eugenia Potter, and Paula Surmann for expertise in editing, layout, cover design, and document production.

We also acknowledge the careful scrutiny of the bibliographic references conducted by Linda Fitch.

I. PURPOSE OF THE STUDY

The purpose of the study was to examine the efficacy of professional development for teachers in the 6+1 Trait[®] Writing model with respect to improving student writing skills. To achieve this purpose, a randomized experimental study was conducted in 2003–2004 to determine the extent to which a two-day workshop on 6+1 Trait[®] Writing affected teacher practices and student achievement in writing. Teachers and their classes in grades 4 to 6 were randomly assigned to experimental and control groups as described under the research design. Student achievement was measured by having students write on assigned prompts to produce narrative, descriptive, or persuasive pieces of writing. The study examined fidelity of implementation through a teacher survey of classroom practices to determine the extent to which teachers implemented the desired practices and to describe differences between classroom practices of teachers in the treatment group and those of teachers in the control group.

II. NEED FOR THE STUDY

The 2002 National Assessment of Educational Progress results in writing showed that the percent of students achieving at the proficient level or better was only 28 percent in grade 4, 31 percent in grade 8, and 24 percent in grade 12 (Persky, et al., 2003). Increases in these percentages between 1998 and 2002 were small at all grade levels, and not statistically significant at grade 12. In grade 12 there was a statistically significant increase in the percentage of students below the basic level between 1998 and 2002. A significant achievement gap persists nationwide between the Asian/Pacific Islander/White group of students (7–10 percent below basic) and the Hispanic/African American group (23 percent below basic). The achievement gap is also large between children of poverty and other students, based on eligibility for free or reduced-price lunch.

These assessment results raise special concerns because writing is a critical life skill and writing also supports the development of reading and thinking skills. Although there is a widespread belief that children must learn to read before they can write, Bissex (1980), Chomsky (1971), and Graves (1983) found that young children begin writing as they learn to read. Young children also have a need to communicate ideas and concepts that have been discovered by experience in addition to those obtained from print. This communication serves not only to share thoughts, but to organize them into coherent categories. The skills of reading and writing emerge in young children as a process of combining oral language, pictures, print, and play to create a coherent but mixed medium of communicating meaning (International Reading Association and National Association for the Education of Young Children, 1998). Children initially use the patterns of visual and physical cues around symbols to gain meaning, but this gradually gives way to the

understanding that the symbols themselves have meaning. There is also a strong connection between writing and learning to think systematically. Sommers (1980; 1982) described writing as a revision process in which ideas are developed, and Zinsser (1988) described it as a process of breaking ideas down into units and placing them in logical sequence.

The current study contributes to the educational research knowledge in two key areas related to the above issue. It examines the effectiveness of (1) specific strategies that integrate assessment and instruction for improving students' writing skills, and (2) a professional development package designed to help teachers implement those strategies more effectively. Since there is a limited amount of research on the impact of professional development on student achievement and much of the available research has been conducted in science and mathematics education (Guskey, 2003), this study contributes to an area in which there is a shortage of current research.

The importance of professional development for improving teacher quality (and, by implication, student achievement) suggests that the efficacy of teacher professional development is critical to improving student learning; it is critical in helping teachers learn and implement effective strategies. Teacher quality may well be the single most critical factor in addressing improved learning for all students, as it emerges as the primary factor that predicts students' learning gains and achievement (National Commission on Teaching & America's Future, 1996; Hawley & Valli, 1999; Rivkin, Hanusheck, & Kain, 1998, as cited in Mayer et al., 2000; Darling-Hammond, 1999). However, classroom experience alone is not sufficient to improve teacher quality. Rosenholtz (1989) found a negative correlation between the years of classroom experience a teacher had and the students' gains in reading, while Wenglinsky (2000) found no correlation between teacher experience and student achievement in mathematics and science. Teachers must have ongoing opportunities to learn and improve their teaching strategies.

Teachers who have attended training sessions on the 6+1 Trait[®] Writing model have been very positive about this professional development and have indicated that they have used the model effectively to improve student writing. However, there is limited research evidence to support the claim for improved student performance resulting from implementing this approach. Since this model is widely used, there is a need for experimental research on its impact on teacher practices and student achievement.

Only one experimental research study was located that specifically examined the impact of the 6+1 Trait[®] Writing model on student learning, and it was conducted during the 1992–1993 school year (Arter, Spandel, Culham, & Pollard, 1994). This study measured the impact of intensive teacher training on the NWREL writing traits on student achievement in writing. Six fifth-grade classrooms were randomly assigned to either a treatment or control condition. Teachers in the treatment group received training to use the writing traits in the assessment of student work and specific lesson plans and

strategies to enhance student writing performance through direct writing instruction. The training promoted an integration of writing assessment and instruction. In addition, these teachers received training materials and intensive follow-up assistance throughout the year. The study found that students in the experimental group experienced a significantly higher increase in test scores for the Ideas trait when compared to students in the control group.

III. BACKGROUND

The trait-based approach to writing was developed in the mid-1980s in response to teachers' needs for an assessment tool that was more closely linked to effective writing instruction. In 1983, the research on writing process and the emergence of analytic scales were brought together by teachers in Beaverton, Oregon (Grundy, 1986), to provide the foundation for the development of the 6+1 Trait[®] Writing model. Researchers at the Northwest Regional Educational Laboratory (NWREL), working with teachers and district staff, created a reliable scoring guide for the writing traits, which also could be used to guide classroom instruction. This work also involved staff members from Missoula, Montana. NWREL continued to develop and refine the model which resulted in the current expanded framework for teaching and assessing student writing that includes the following seven traits: Ideas, Organization, Voice, Word Choice, Sentence Fluency, Conventions, and Presentation. NWREL developed a set of training materials for teachers and more than 15,000 teachers have received training during the past 15 years in the use of this model to teach writing and assess students' writing skills. As the model developed, teaching strategies were expanded, resulting in a comprehensive analytic approach that integrates instruction, student work, and assessment to improve the quality of student writing. Using scores keyed to each trait of good writing, teachers could reinforce successful writing practices and, using those same data, they could design new instructional lessons and strategies to address areas where students were not as strong. This traits-based model for writing and the training package is called 6+1 Trait[®] Writing for Assessment and Instruction. The abbreviated title, the 6+1 Trait[®] Writing model, is used in this report.

The training provided by NWREL instructs teachers in the use of these traits to evaluate student writing and to plan and deliver instruction. Language is provided to help students understand how the traits are reflected in good writing and to use this understanding to improve their own writing. This is strengthened through the use of specific rubrics and samples of student writing to illustrate these traits.

Both the classroom intervention and the professional development package are currently in wide use across the United States and in other countries. Since 1990, NWREL has conducted 439 training sessions using this model, and these sessions have involved more than 15,000 participants from all 50 states and 17 countries. NWREL has a contract with an intermediate educational agency in Texas to provide training in that state, and 63

training sessions involving more than 2,000 participants have been conducted through that contract during the past two years. NWREL also conducts a training-of-trainers institute; educators who attend this institute receive a full training package and are given permission to conduct training in their local school jurisdictions. NWREL does not collect information on those local training sessions, but 1,365 trainers have been trained by NWREL since 1998; records prior to 1998 are not available. Teachers who have attended training sessions on 6+1 Trait[®] Writing have been very positive about this professional development and have indicated that they have used the model effectively to improve student writing.

NWREL has produced a number of classroom support materials for 6+1 Trait[®] Writing that are used extensively by classroom teachers. The two main resources are *Seeing With New Eyes,* a product for primary teachers (Northwest Regional Educational Laboratory, 1999) and *Picture Books,* a resource for teachers at all levels, which provides annotations of picture books and sample lesson plans for the use of picture books as a teaching tool to illustrate the qualities of excellent writing (Bellamy, 2004). During the past 10 years, teachers have purchased 62,200 and 80,000 copies of these two publications, respectively. A 6+1 Trait[®] Writing textbook (grades 3–12) was published last year by Scholastic (Culham, 2003) and approximately 83,000 copies have been sold to date.

IV. THE 6+1 TRAIT[®] WRITING MODEL

The intervention in this study is an approach to teaching and assessing student writing that consists of a set of strategies to facilitate the integration of assessment and instruction. These strategies are supported by classroom materials and professional development designed to build teacher understanding of these strategies and teacher knowledge of the characteristics of quality writing, and to improve teachers' skills in implementing strategies to help students write more effectively. Teachers receive a large quantity of material that they can use for instruction and assessment in their language arts programs.

The 6+1 Trait[®] Writing model has been designed to help teachers teach and assess student writing through an analytic approach by focusing on the following seven traits that characterize quality writing:

- Ideas make up the content of the piece of writing—the message.
- Organization is the internal structure of the piece—the thread of meaning and the logical pattern of the ideas.
- Voice is the soul of the piece. It is what makes the writer's style singular, as his or her feelings and convictions come out through the words.
- Word Choice is at its best when it includes the use of rich, colorful, and precise language that moves and enlightens the reader.

- Sentence Fluency is the flow of language and the sound of word patterns.
- Conventions represent level of correctness—the extent to which the writer uses grammar and mechanics with precision.
- Presentation relates to form and layout—the physical appearance of the finished work.

Specific instructional strategies have been designed to provide teachers with a range of activities to engage students in learning about the traits, to provide direct instruction on each trait, and to provide formative assessment feedback to students. These include teaching the language of the traits, having students work with the rubrics and samples of student writing, peer editing, and focused lessons on each trait. These instructional strategies are listed in Appendix A.

It is expected that the following would be observed in classrooms in which teachers are implementing the 6+1 Trait® Writing model:

- The teacher would introduce the traits one at a time in a cumulative sequence. Students would become familiar with the trait scoring system, and then the scoring guide criteria for the particular trait.
- Students would write pieces in various forms and modes, and participate in both peer and group revision sessions focused on selected traits.
- The teacher would conduct frequent whole-group scoring and discussion sessions using sample anonymous papers. In addition, the teacher would read frequently to the students from a wide variety of quality written material, followed by discussion around the use of selected traits by the author.
- The teacher would conduct frequent conferences with individual students to provide specific feedback to the students on their writing.
- Students would create a writing folder in which to keep works in progress, where they store specific writing goals, and where they track their own performance compared to their goals and the state or district standards for their age/grade.

Professional Development for 6+1 Trait® Writing

The 6+1 Trait® Writing workshop used in this study consisted of a two-day training session that included an overview of the writing process, an analysis of the qualities of good writing, and a description of the advantages of analytic assessment compared to the holistic method for providing feedback to students and engaging students in an examination of the quality of their own writing. Participants then examined the parts of an analytic scoring guide (criteria/scoring scale) and the basic procedures for its use. The scoring rubrics are presented in Appendix C. The remainder of the first day was spent examining and using the scoring guide. Participants were introduced to each trait individually and given an opportunity to practice using the scoring guide to assess a piece

of writing. Participants developed an understanding of each trait by reading a definition of the trait, participating in an activity involving the trait, group and individual practice scoring and providing feedback, using sample papers, and ending with a whole group comparison of scores to introduce the concept of consistency.

The introduction to each trait at the workshop involved the following procedure:

- Definition of the trait
- Activity involving the trait (e.g., read aloud, videotape)
- Group practice using the trait, involving reading sample papers and orally suggesting feedback based on trait criteria, and scoring the trait to compare with the group and "official" score
- Individual practice in scoring and providing feedback, using sample papers with a partner (the emphasis is on effective feedback specific to the trait and specific to the paper)
- Whole-group comparison of scores to introduce the concept of scoring consistency

During the second day of training, participants became proficient in scoring student work, and learned a variety of instructional strategies. Participants scored sample student writing for all seven traits; scores assigned by individual teachers were compared to the group results to examine consistency. Ten strategies for teaching and implementing the traits with students were presented and practiced; these strategies are described in Appendix A. They include teaching the language of the traits, having students work with the rubrics and samples of student writing, peer editing, and focused lessons on each trait.

Research Literature
Supporting a Traits Approach in Writing

Much of the developmental work for the 6+1 Trait[®] Writing model was based on the work of Diederich (1974) and Purves (1988), who were instrumental in moving the educational research field away from holistic assessments to classroom-based analytical assessments of student writing to meet the needs of teachers for diagnostic assessment data on which to base their instruction. Prior to Diederich's landmark work, most large-scale assessment of student work used a holistic approach, whereby raters assigned a single score to represent the overall quality of a student paper. Although many researchers recognized the limitations of the holistic approach in guiding student improvement, Diederich was one of the first researchers to develop an analytical component framework for assessing the individual component qualities of good writing, which he called factors. This built on earlier work in which eight scales were identified to describe the qualities that teachers look for in written compositions (Diederich, French, & Carlton, 1961). The following eight factors or traits describing the qualities of good writing were identified through regression models and a factor analysis: ideas, usage,

organization and analysis, wording and phrasing, flavor, punctuation, spelling, and handwriting.

Purves (1988) used an analytical scoring framework in a 10-year, cross-cultural study he conducted under the auspices of the International Association for the Evaluation of Educational Achievement. He found that, although there existed some variation among the scoring patterns of raters from different countries (i.e., the United States, Finland, and Germany), there was a consistent and strong independence among trait scores, thus validating the analytic framework.

Another area of research that influenced the 6+1 Trait® Writing model is writing process. Although the concept of writing process predates the 1970s, the first major study on the writing process was Emig's (1971) research. Prior to this, the common practice in writing was to give an assignment, give students time to complete it, and then comment extensively on the final product (Applebee, 1986). Emig's research showed that the traditional grammar- or outline-based models were product-centered, and confined student writing. She drew on her own knowledge and experience as a writer to develop a process model that was quickly emulated and followed by other studies that emphasized (1) writing processes that are recursive rather than linear, including planning, organization, drafting, and editing; and (2) writing processes that vary according to task and instructional context. By 1986, in *What Works,* the U.S. Department of Education felt justified in pointing to process as the most effective way to teach writing (as cited in Newell, 1998).

Flower and Hayes (1981) divided "composing" into three areas, the most influential being writing process. They subdivided this process into reviewing (revising and evaluating), translating, and planning (generating, goal setting, and organizing). They described the writing process as taking place inside the writer's head, while other types of composing were described as being environmental in nature (task environment, long-term memory, and social context). An important condition that Flower and Hayes attached to the effective use of the writing process is that it be recursive. In other words, the writer moves back and forth between different parts of the process, rather than proceeding through it in a linear fashion. They visualized a loose hierarchy deriving from the natural relationship between the aspects of the writing process.

Applebee (1986) identified a tendency, even of experienced teachers, to use the process as a lockstep set of activities. The process then becomes a set of procedural directions, separated from its real purpose of being a solution to writing problems. He pointed to the use of instructional scaffolding to support students in the various stages of the composing process. This term refers to a structured classroom culture in which students can successfully complete a task, eventually freeing themselves of the scaffold to claim the culture as their own.

The 6+1 Trait® Writing model incorporates writing process as an integral component of a recursive set of activities that develop the seven traits that characterize quality writing.

A traits-based approach to writing instruction is also supported by a meta-analysis of 20 years of research on student writing conducted by Hillocks (1987). He reviewed 2,000 studies on the process of writing and identified the following six instructional methods commonly adopted as a curriculum or program focus:

- Grammar, teaching parts of speech and parsing (diagramming) of sentences
- Models, presenting good pieces of writing that show particular structures or modes
- Sentence combining, building complex sentences from simpler examples
- Scales, training students to use sets of criteria to judge the quality of their work
- Inquiry, transforming data and information into generalizations and arguments for writing tasks
- Free writing, having students write freely about whatever interests them

Hillocks (1987) identified the use of scales as having a positive effect on improving student writing. The effect size for scales was second only to the effect size for inquiry. Knowledge of scales appears to help students develop an understanding of discourse knowledge, the ability to present ideas and information in a coherent manner. This method, of which 6+1 Trait[®] Writing is an example, employs sets of criteria to evaluate pieces of work. Students learn to apply the criteria to compositions of varying levels of quality until they can competently review and revise their own work.

Hillocks concluded that the most effective writing program would contain elements that develop procedural knowledge of the composing process (sentence combining); discourse knowledge for the production of coherent written communication (scales); and transformational knowledge supporting the acquisition, access, and generation of information and ideas for writing (inquiry). The 6+1 Trait[®] Writing model emphasizes the first two elements, and addresses the third through prewriting strategies.

The 6+1 Trait[®] Writing model incorporates collaboration among peers in the writing process, which has some support from research. DiPardo and Freedman (1988), in their review of research on peer response groups, reported that research in this area has produced disparate findings on the success of the model. Part of the issue lies in the multiple uses that the groups are expected to achieve, including responses to writing, collaborative thinking about writing, collaborative writing, and editing student work. They reported that the groups that seemed most successful were those solving a common problem and those writing a collaborative piece (Freedman, Dyson, Flower, & Chafe, 1987).

There is some indication that there may be indirect benefits from the use of response groups. It appears to support the shift in instructional emphasis from product to process by providing time for extensive revision, and by providing continuous support throughout the process even when the teacher may not be available (Flower, 1979; Freedman, et al., 1987). In addition, response groups support the social interaction considered critical to

the acquisition of written language (Vygotsky, 1978). Studies have also found that students working in groups made significant gains in measurable writing ability over students working individually. Students working in groups used revision as a reconceptualizing opportunity, while individuals saw it simply as editing.

DiPardo and Freedman (1988) characterized the components of an effective cooperative writing environment as one where the classroom is a resource room, power is productively shared, the teacher is a knowledgeable coach, students are colleagues, and the teacher and students are mutually engaged in talking, reading, and writing. Members of the class give and receive feedback across varied audiences, at various points in the writing process.

A key focus of the 6+1 Trait[®] Writing model is to help teachers to provide effective feedback to students and to develop self-assessment skills in students so that they make improvements in their own drafts. Three reviews of the research on the effectiveness of formative assessment to increase student achievement have consistently demonstrated that assessment providing students with feedback about their performances increases subsequent performances (Natriello, 1987; Crooks, 1988; Black & Wiliam, 1998). A key factor in the success of formative assessment is the benefit to student achievement resulting from self-assessment based on an understanding of the goals of learning and the criteria by which students are evaluated (Fontana & Fernandes, 1994). Formative assessment is grounded in the feedback model of Sadler (1989) whereby students have access to three types of information about a particular performance. The first is the vision of what the instructional goal or outcome is intended to be. The second is an indication of where a current performance matches or does not match that vision. Finally, the third is the articulation of some mechanism of how the students might move from current insufficient performance toward that vision. The 6+1 Trait[®] Writing model uses specific rubrics and samples of student writing to provide the structure for such information.

This is also supported by Marzano's (2003) synthesis of 35 years of research on effective schools, from which he identified a set of 11 strategies that characterize high-achieving schools. Effective monitoring and feedback of assessment information to students was ranked second out of the 11 characteristics. Marzano identified a number of features of feedback that make it successful, such as being timely and ongoing throughout the learning process, specific to the content being learned, aligned with assessment, and formative in nature. The 6+1 Trait[®] Writing model meets all these criteria. The application of this model by students helps them to internalize and use feedback and to generate their own feedback as they work through their own process of writing. The encouragement of peer revision means that it may be accessed many times during the process.

The analytic approach to assessment in the 6+1 Trait[®] Writing model is consistent with Popham's (2003) five criteria for instructionally effective assessments: significance, teachability, describability, reportability, and nonintrusiveness. Significance derives from

the fact that the areas of measurement were a synthesis of what expert writers considered the most important aspects of good writing. Teachability is shown by the evolution of the analytic assessment model into a valuable teaching tool. Describability has been ensured by the development of scoring guides that describe in detail the characteristics of each level of performance and the provision of samples of student work to illustrate these characteristics. Reportability is accomplished by the specific levels of achievement indicated by the scores for each trait, that then form a foundation for teacher-student conferencing. When developed as an ongoing strategy, the model becomes an embedded part of the teaching-learning cycle and makes no additional intrusion into class time, satisfying the nonintrusiveness criterion.

Research Literature on Professional Development

Teacher quality may well be the single most critical factor in addressing improved learning for all students, as it emerges as the primary factor that predicts students' learning gains and achievement (NCTAF, 1996; Hawley & Valli, 1999; Rivkin, Hanusheck, & Kain, 1998, as cited in Mayer et al., 2000; Darling-Hammond, 1999). However, classroom experience alone is not sufficient to improve teacher quality. Rosenholtz (1989) found a negative correlation between the years of classroom experience a teacher had and the students' gains in reading, while Wenglinsky (2000) found no correlation between teacher experience and student achievement in mathematics and science. Teachers must have ongoing opportunities to learn and improve their teaching strategies. The importance of professional development for improving teacher quality (and, by implication, student achievement) suggests that the efficacy of teacher professional development is critical to improving student learning. Professional development is critical in helping teachers learn and implement effective strategies for improving student achievement.

Although the efficacy of professional development for teachers is critical to improvements in student achievement, a review of the literature on professional development does not reveal conclusive evidence on the "best" approaches. Some studies have found that the intensity and duration of professional development influence the extent of teacher change (Shields, Marsh, & Adelman, 1998; Weiss et al., 1998, as cited in Desimone, Porter, Garet, Yoon, & Birman, 2002). Other studies suggest that professional development focused on math and science content and pedagogical knowledge may be more influential than professional development focused on general content and pedagogy (Cohen & Hill, 1998; Kennedy, 1998). Research reviews reveal that there is not a great deal of experimental research evidence for several of these assertions (Desimone et al., 2002; Guskey, 2003; Garet, Porter, Desimone, Birman, & Yoon, 2001).

Despite these inconsistent research findings, one generalization that is supported by a body of research is that a focus on specific teaching practices increases the probability that teachers will use those practices (Desimone et al., 2002). The content of the

professional development for the 6+1 Trait® Writing model places a high emphasis on specific practices and materials that teachers can use immediately following the training.

Additional research on professional development is discussed under Recommendations, below, as it applies to the recommendations for further research.

V. RESEARCH DESIGN

This study examined the extent to which a two-day teacher workshop on the 6+1 Trait® Writing model resulted in the intended changes in teacher practices for teaching and assessing student writing, and the impact of this training on student achievement in writing. The study employed an experimental design with one treatment factor and repeated measures on the dependent student achievement variables. The experimental design was a 2x2 model with the following factors:

- Experimental conditions (one treatment and one control group with teachers randomly assigned to groups within each of four grades)
- Testing time (pretreatment assessment administered in October 2003 and posttreatment assessment administered in June 2004) with training in mid-November 2003

This experimental design was applied independently at four grades with respect to the measurement and analysis of student achievement data (grades 3, 4, 5, and 6) because the writing assessment did not have an underlying common scale across the four grades. The application of the scoring rubrics was based on anchor papers selected specifically for each grade level so that the levels in the scoring rubrics could be interpreted against expectations for writing at each grade, which change considerably from grade 3 to grade 6. The scoring process is described under Data Collection, below.

The intervention for the study was the 6+1 Trait® Writing model, which is an approach to teaching and assessing student writing that consists of a set of strategies to facilitate the integration of assessment and instruction. These strategies are supported by classroom materials and professional development designed to build teacher understanding of these strategies and teacher knowledge of the characteristics of quality writing, and to improve teachers' skills in implementing these strategies to help students write more effectively. Teachers receive a large quantity of material that they can use for instruction and assessment in their language arts programs.

Teachers in the treatment group received two days of training in 6+1 Trait® Writing in November 2003, conducted by a NWREL trainer at a location in the participating school district. The two-day workshop is described above in "The 6+1 Trait® Writing Model." Teachers in the treatment group were asked to use the model in teaching writing for the remainder of the school year. Teachers in the control group were asked to teach writing in

the way that they had in the past. They were asked not to access resources on the 6+1 Trait[®] Writing model from other teachers in their school, and not to discuss this model with teachers in the treatment group. Following the completion of the data collection, teachers in the control group received training in 6+1 Trait[®] Writing to encourage a schoolwide focus on implementing this model after the completion of the experimental study.

The dependent variables, which are described below in Data Collection, are measures of teacher practices and student achievement in writing.

Research Questions

The research questions reflect the underlying causal model that good professional development first elicits change in teacher practices that subsequently leads to more effective student learning and to higher levels of student achievement. This study was designed to answer the following questions:

1. To what extent will teachers in grades 3 to 6 implement the strategies presented in the 6+1 Trait[®] Writing model following a two-day training session?
2. Following the implementation of the intervention, will the quality of writing produced by students in the treatment group be higher than that produced by students in the control group?

The first question addresses the fidelity of implementation of the intervention. Data relevant to this question include information on the classroom practices of the teachers in the treatment group related to the strategies contained in the 6+1 Trait[®] Writing model. This question was also examined by comparing practices of teachers in the treatment group with those of teachers in the control group. Results were not disaggregated by grade because teachers at all grade levels were expected to implement the same practices.

The second question addresses the impact of the intervention on student achievement. This question was answered through a series of analyses of student assessment results prior to and following the intervention. This research question was examined independently at the four grade levels.

Sample

The study was conducted in one school district and involved 76 teachers and their classes in grades 3 to 6. Within each grade level, half the teachers were randomly assigned to the treatment group and half were randomly assigned to the control group. The student sample had a very low proportion of both English language learners and racial minorities (less than 1 percent); 10 percent of the students in the sample were eligible for free or reduced-price lunch; and 11 percent were in special education. These were equally

distributed across the experimental and control groups. A district with greater diversity had been identified, but decided not to participate in the study.

Three teachers assigned to the treatment group were dropped from the study; two were not able to attend the training and one took maternity leave partway through the school year. One teacher in the control group did not submit a complete set of student compositions. The final analysis was conducted on results from 72 classrooms with complete data for 1,592 students (424 in grade 3, 419 in grade 4, 386 in grade 5, and 363 in grade 6). The number of teachers in the treatment group in grades 3, 4, 5, and 6 was 9, 10, 9, and 7, respectively. The corresponding numbers for the control group were 10, 10, 9, and 8.

Data Collection

In order to address the research questions on fidelity of implementation and impact of the intervention on student achievement, data collection for this study focused on teacher practices related to the writing component of the language arts program and on student performance in writing.

All students in the treatment and control groups submitted two pieces of writing, one in the fall before the teacher training and one at the end of the school year. For grades 3 and 4, one piece of writing was narrative and one was descriptive. The genres were randomly assigned to students in each class in the fall so that half the students did narrative writing and half did descriptive writing. At the end of the school year, students were assigned narrative prompts if they did descriptive writing in the fall, and they were assigned descriptive prompts if they did narrative writing in the fall. Each student booklet contained two writing prompts for a given genre and students were asked to write on one of these assigned prompts. The prompts were identical for grades 3 and 4.

For grades 5 and 6, one piece of writing was narrative and one was persuasive and students in grades 5 and 6 received the same writing prompts. The process used for alternating prompts in grades 3 and 4 was followed in grades 5 and 6. A sample writing booklet and all writing prompts are presented in Appendix B.

Student writing was scored at the NWREL scoring center employing raters who have had extensive experience in scoring student writing. Student writing was evaluated for six traits using the five-point analytic rubrics developed for the 6+1 Trait® Writing model; student writing was not evaluated for presentation. In addition, the overall quality of writing was evaluated using a six-point holistic scale that is not part of the model framework. This rubric was selected in order to provide an evaluation criterion that had been developed independent of the 6+1 Trait® Writing model. The rubrics are presented in Appendix C.

Each writing sample was scored by two raters independently. One scoring team applied the holistic rubric while a second team applied the six analytic rubrics. If the two scores for a given writing sample were separated by one point, the average of the two scores was assigned to that writing sample. If the two scores were separated by more than one point, the writing sample was read by a third reader who assigned the final scale score. All writing samples were scored at a scoring session during the summer following the completion of the experimental study. Raters did not know whether they were reading samples from the treatment or control group, or from the pretest or posttest administrations.

The first step in the scoring process was the selection of anchor papers to represent points on the holistic and analytic scales. Separate anchor papers were selected specifically for each grade level so that the levels in the scoring rubrics could be interpreted against expectations for writing at each grade. Although the scoring process employed experienced raters, additional training was provided in the application of the rubrics and corresponding anchor papers. Cohen's Kappa coefficient, modified by Gwet (2002), was used as the inter-rater reliability coefficient. The coefficients ranged from 0.91 to 0.99 for the members of the holistic team, and from 0.96 to 0.99 for the analytic team. The rate of scoring discrepancies ranged from 0.5 percent to 9 percent.

A nonparametric correlation coefficient (Kendall's tau) was used to explore the relationships between the trait scores and the holistic scores and among the first six traits because the points on the rubrics do not constitute an interval scale. The nonparametric coefficients were about 0.1 lower than the product-moment coefficients at all grade levels. Correlation coefficients were computed separately by grade level, and all correlations were significant (alpha < 0.001). A moderate relationship between the trait scores and the holistic scores was observed at all grade levels, with the correlations being slightly higher at grade 3. The correlation coefficients between trait and holistic scores ranged from 0.54 to 0.64 at grade 3 and from 0.40 to 0.57 at grades 4 to 6. The coefficients for Ideas were consistently higher and the coefficients for Word Choice were consistently lower across the grades.

The inter-correlation coefficients among the trait scores were also slightly higher at grade 3 than at the other grades. These coefficients ranged from 0.53 to 0.69 at grade 3 and from 0.33 to 0.69 at grades 4 to 6. The coefficients between Word Choice and Sentence Fluency and between Sentence Fluency and Conventions were consistently higher at all grade levels. Coefficients between Ideas and Organization and between Organization and Sentence Fluency also tended to be higher. At all grade levels, the two lowest coefficients were between Conventions and Ideas and between Conventions and Voice. These correlation coefficients indicate that the seven scores do represent different features of student writing.

Teachers completed a survey about their classroom practices for teaching writing in June when they administered the posttest. The survey included questions about the writing

process, specific instruction on various qualities of a piece of writing, the use of rubrics, and the use of samples of student writing. Teachers in the treatment group also responded to questions about specific instruction on the traits, the impact of the training on their teaching practices, and the ability of their students to understand and work with the traits. The survey is presented in Appendix D.

Nine classroom observations were conducted in classrooms in the treatment group to collect additional data on classroom practices using the classroom observation protocol in Appendix E. A larger number of classroom visits had been planned to collect more comprehensive data related to fidelity of implementation. Initially, a district staff member had been identified to conduct classroom observations, but district workload did not permit this to happen. The nine visits were conducted by the NWREL trainer, but there was not a sufficient budget to enable the trainer to conduct a larger number of classroom observations.

Data Analysis

Student outcomes were the main focus of the analyses. This addressed the second research question concerning the impact of the intervention on student achievement. The student-level dependent variables were the scores on the six-point holistic scale and the scores on the five-point analytic scales for the first six traits. Since the writing assessments were not on a common scale across the grades, separate analyses were conducted for the student achievement data at the four grade levels (3, 4, 5, and 6).

The random assignment of teachers to treatment conditions and the measurement of individual student achievement in writing resulted in a model in which the independent variable was at the classroom level and the dependent variable was at the student level. Hierarchical linear modeling (two levels) was used to partition the variance into effects to account for this nesting of students within classes (Hox, 2002; Raudenbush & Bryk, 2002). The SPSS Linear Mixed Model facility was used to construct a model that preserved this hierarchical structure of the data.

The initial linear mixed model was based on the assumption that the posttest score for a student would be linearly related to the pretest score, and that this pre-to-post relationship might vary from one classroom to another. A random-coefficient regression model was constructed, consisting of as many classroom-specific regression lines as the number of classrooms in the study. The model is expressed mathematically as:

Post = Intercept [F] + Centered_Pre [F] + Teacher Intercept [R]
+ Teacher Slope (Centered_Pre) [R] + Residual [R]

- Post: Posttest score of a student
- Centered_Pre: Pretest score of a student, expressed as a deviation from the classroom mean

- Teacher Intercept and Slope: The intercept and the slope of a classroom-specific regression line predicting the posttest score from the pretest score
- [F] indicates a fixed effect, whereas [R] indicates a random effect

According to the analysis of covariance parameters, significant variations were found among different classrooms regarding classroom-specific regression lines.

To assess the effect of the intervention on the student score, a second model was created that is expressed mathematically as:

Post = Intercept [F] + Condition [F] + Centered_Pre [F]
+ Condition x Centered_Pre [F]
+ Teacher Intercept [R] + Teacher Slope (Centered_Pre) [R]
+ Residual [R]

The estimates of fixed effects showed that the interaction term was not significant. Consequently, this term was dropped and a simplified model was established:

Post = Intercept [F] + Condition [F] + Centered_Pre [F]
+ Teacher Intercept [R] + Teacher Slope (Centered_Pre) [R]
+ Residual [R]

The second model did not have a better fit to the data, but the experimental condition was retained in the model in the subsequent analyses as its effect on the student score was the primary interest of this study. This model was applied to the seven dependent student achievement scores at each of the four grade levels.

Teacher Practices

Measures of fidelity of implementation of the intervention were obtained from the teacher survey data, which addressed the first research question. Descriptive statistics were used to summarize the responses from the teachers in the treatment group on the fixed-response items concerning specific instruction on the traits, the impact of the training on their teaching practices, and the responses of their students to these strategies. Three single-factor analyses of variance were conducted to test for significant differences between mean responses of control and treatment teachers to the fixed-response questions on general classroom practices for teaching writing. Teacher comments were reviewed to identify emergent themes across teachers in the treatment and control groups. Information from the classroom observations was insufficient to provide generalizations concerning the level of implementation of the intervention, but it provided some support for the results from the teacher survey.

VI. TEACHER SURVEY RESULTS

The results of the teacher survey provide an indication of the level of implementation that was achieved as a result of the two-day training session. Teachers in the treatment group responded to questions about the implementation of 6+1 Trait® Writing and all teachers were asked general questions about the writing process, specific instruction on various qualities of a piece of writing, the use of rubrics, and the use of samples of student writing. The surveys were completed in June when the posttest was administered. The detailed results for the survey questions are presented in Appendix D.

Teachers in the treatment group were asked about specific instruction on each of the traits; the percent of teachers indicating that they had spent "a great deal" or "a moderate amount" of time teaching each trait is given in Table 1.

Table 1: Amount of Specific Instruction on Each Trait

Trait	Percent of Teachers	
	A great deal	A moderate amount
Ideas	38%	53%
Organization	47%	44%
Voice	16%	48%
Word choice	34%	44%
Sentence fluency	25%	53%
Conventions	31%	59%
Presentation	13%	41%

Teachers reported a considerable focus on direct instruction on most of the traits; 90 percent reported "a great deal" or "a moderate amount" for Ideas, Organization, and Conventions. Approximately 80 percent gave these responses for Word Choice and Sentence Fluency. The percentages for Voice and Presentation were 64 percent and 54 percent, respectively. The trait that received the most attention was Organization, with 47 percent of teachers reporting "a great deal" of specific instruction. Very few teachers reported that they provided no instruction on specific traits; the highest percentages providing no instruction were 16 percent for Voice and 9 percent for Sentence Fluency.

Teachers in the treatment group gave positive responses concerning the effects of training on their teaching; 80 to 90 percent of teachers agreed that the training helped them to improve their writing instruction and their understanding of the qualities of good writing, and improved their ability to provide effective feedback to students. Eighty-five percent

and 76 percent, respectively, agreed that their students developed a good understanding of the traits and that students were able to use the traits to improve their writing. Fifty-five percent agreed that it helped them to communicate more effectively with parents, and 53 percent agreed that students were able to use the traits effectively for self-assessment. Only 17 percent agreed that students with learning disabilities used the trait structure to scaffold their work.

A key feature of the training was to encourage teachers to use rubrics and samples of student writing to help students to improve the quality of their own writing. Table 2 shows the percent of teachers in the control and treatment groups who said they used the specified strategy "very frequently." A greater percent of teachers in the treatment group reported using three of the four strategies "very frequently."

Table 2: Percent of Teachers Reporting "Very Frequent" Use of Selected Strategies

Strategy	Percent of Teachers	
	Treatment	Control
Use rubrics to explain what is expected	38%	32%
Use samples of student writing to show excellent qualities in writing	35%	18%
Ask students to compare their writing with samples of excellent writing	3%	12%
Ask students to discuss specific features of their writing	24%	9%

Table 3 shows the reported emphasis that teachers placed on specific instruction on qualities of writing that are closely linked to a number of the traits. It would be expected that the teachers in the treatment group would have reported more specific instruction on these aspects of writing because the training in 6+1 Trait® Writing provides strategies for providing specific instruction in these areas. One explanation for the opposite trend shown in the results could be that the teachers in the treatment group had a clearer understanding of these aspects of writing following training and were in a better position to judge whether or not they were providing specific instruction. Teachers in the control group may have overestimated the amount of direct instruction.

Table 3: Percent of Teachers Reporting "A Great Deal" of Specific Instruction

Topic or Skill	Percent of Teachers	
	Treatment	Control
Generating rich ideas and content	41%	49%
Organizing content effectively	53%	65%
Using effective language	44%	50%
Connecting with the reader	18%	24%
Using conventions correctly	50%	56%
Using effective strategies for revising writing	21%	47%

Teachers were asked about the length of time spent on aspects of the writing process such as prewriting, writing drafts, and revising drafts. Teachers in the treatment group reported using these aspects of the writing process for a greater proportion of their writing assignments, but the average length of time that teachers spent on these writing processes for a typical assignment was about the same in the treatment and control groups.

The responses for the items in questions 3, 4, and 5 are four-point scales. The sum of the teacher responses to the items in each question was calculated to yield three total scores with possible ranges of 6 to 24 for questions 3 and 4, and 4 to 16 for question 5. The scales were reversed for each item so that a higher score indicated a more positive response. Three separate single-factor analyses of variance were conducted to test for significant differences between the mean scores for teachers in the treatment and control groups. None of the differences were statistically significant.

The teacher comments to the open-response items on the survey were very general in nature, and do not provide a basis for assessing differences in classroom practices between treatment and control teachers. Some teachers in the treatment group provide comprehensive descriptions of processes for implementing the 6+1 Trait® Writing model. Teacher comments are summarized in Appendix D. On questions about general classroom practices concerning writing instruction, the responses from teachers in the control group were similar to those from the teachers in the treatment group.

Although the number of classroom observations was too few to provide a general assessment of the level of implementation, it did identify a wide range of strategies in the nine observed lessons. One teacher presented an outstanding lesson incorporating the key features of 6+1 Trait® Writing in a fully integrated manner, while another teacher introduced the traits in a very superficial manner. The other seven observations were between these two with respect to extent of implementation of the intervention.

In general, the results from the teacher survey indicated that teachers in the treatment group had implemented 6+1 Trait® Writing to a considerable extent.

VII. STUDENT ACHIEVEMENT RESULTS

The second research question related to posttreatment differences in student achievement between treatment and control groups. The analyses for all data sets with respect to this question showed no significant differences between the mean posttest writing scores for the treatment group and the mean posttest writing scores for the control group when pretreatment differences were factored into the analyses.

Holistic Score

The pretest and posttest means for the holistic rubric are presented in Table 4 for the treatment and control groups for each grade. The holistic rubric is a six-point scale.

Table 4: Results for the Holistic Score for Treatment and Control Groups by Grade

Grade	Test Time	Treatment Group			Control Group		
		N	Mean	SD	N	Mean	SD
3	Pre	199	3.42	0.846	225	3.57	0.822
	Post	199	3.83	0.871	225	3.90	0.828
4	Pre	207	3.89	0.800	212	3.96	0.849
	Post	207	4.16	0.741	212	4.24	0.812
5	Pre	177	3.70	0.681	209	3.75	0.749
	Post	177	4.03	0.722	209	3.96	0.682
6	Pre	193	4.14	0.751	170	4.28	0.686
	Post	193	4.44	0.761	170	4.44	0.760

The analysis represented by last linear mixed model described above in Data Analysis was conducted on the student achievement data for each grade level to test for significant differences between the posttest means for the treatment and control groups. The result of the analysis for grade 3 holistic score is presented in Table 5, which shows the population estimates for three parameters. "Treatment condition" is the population estimate of the difference between the mean posttest score for the treatment group and the mean posttest score for the control group. A positive value indicates that the observed mean for the control group was higher than that of the treatment group. "Within class slope" is the population estimate of the mean slope of the classroom regression lines for predicting posttest scores from pretest scores. This parameter, which is significantly larger than zero, shows that the pretest score was significantly and positively related to the posttest score. For each grade level, the observed pretest mean for the control group sample was slightly higher than that for the treatment group.

Table 5: Grade 3 Holistic Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.831	0.077	17.4	49.48	0.000
Treatment Condition	0.068	0.107	17.3	0.64	0.530
Within Class Slope	0.574	0.065	19.3	8.81	0.000

The estimates of fixed effects, using the same analysis model for grades 4, 5, and 6, are presented in Appendix G. The population estimates for the treatment effects for each of the four grades are summarized in Table 6. The difference between the holistic posttest mean for the treatment group and the holistic posttest mean for the control group was not statistically significant at any grade level.

Table 6: Estimate of Treatment Effect for Holistic Posttest Score for All Grades

Grade	Estimate	Std. Error	df	t	Sig.
3	0.068	0.107	17.3	0.64	0.530
4	0.111	0.118	17.8	0.94	0.361
5	-0.047	0.095	14.5	-0.50	0.625
6	0.009	0.145	6.7	0.06	0.952

Analytic Trait Scores

The above analysis was duplicated for each grade for the six analytic trait scores (Ideas, Organization, Word Choice, Voice, Sentence Fluency, and Conventions). Student writing samples were not assessed for Presentation. The analytic rubrics were five-point scales. The detailed tables of means and estimates of treatment effects are presented in Appendix F. The estimates of fixed effects, using the same analysis model for grades 4, 5, and 6, are presented in Appendix G for the six traits. The population estimates for the treatment effects for each of the four grades for the six traits are summarized in Table 7.

Table 7: Estimate of Treatment Effect for Trait Posttest Scores for All Grades

Trait	Grade	Estimate	Std. Error	df	t	Sig.
Ideas	3	0.116	0.092	17.4	1.26	0.225
	4	0.003	0.082	17.7	0.04	0.968
	5	-0.022	0.079	15.2	-0.28	0.784
	6	-0.009	0.130	3.7	-0.07	0.951

Table 7: Estimate of Treatment Effect for Trait Posttest Scores for All Grades (Continued)

Trait	Grade	Estimate	Std. Error	df	t	Sig.
Organization	3	0.160	0.101	17.0	1.59	0.131
	4	0.034	0.079	18.0	0.43	0.672
	5	-0.074	0.079	14.9	-0.95	0.359
	6	-0.008	0.089	6.1	-0.09	0.929
Voice	3	0.067	0.095	17.1	0.71	0.488
	4	0.004	0.063	17.1	0.06	0.951
	5	-0.162	0.078	9.1	-2.08	0.067
	6	-0.036	0.071	10.3	-0.51	0.618
Word Choice	3	0.115	0.725	16.9	1.58	0.133
	4	0.011	0.040	16.8	0.27	0.794
	5	-0.043	0.082	15.1	-0.52	0.608
	6	0.004	0.065	12.3	0.07	0.948
Sentence Fluency	3	0.668	0.105	14.6	0.65	0.524
	4	-0.016	0.068	14.8	-0.24	0.817
	5	-0.055	0.056	5.5	-0.98	0.367
	6	Analysis did not converge.				
Conventions	3	0.107	0.111	12.4	0.96	0.351
	4	0.044	0.085	6.0	0.51	0.626
	5	-0.032	0.085	15.1	-0.38	0.710
	6	0.003	0.072	13.0	0.06	0.957

The analysis for Sentence Fluency failed to converge at grade 6.

VIII. DISCUSSION

This section presents the conclusions, limitations, and recommendations.

Conclusions

The results of the teacher survey indicated that teachers in the treatment group had begun to implement the 6+1 Trait® Writing model, but it was not fully implemented by all teachers. This conclusion is supported by the information obtained from nine classroom observations that indicated a wide range of levels of implementation in these nine classrooms. Teachers in the treatment group gave positive responses concerning the

effects of training on their teaching, and they indicated that their students understood the traits and were able to use them. Many of the strategies in the 6+1 Trait® Writing model were practiced extensively by teachers in the control group. This is not surprising because a trait-based approach to writing has been promoted for several years and many teachers and school jurisdictions have incorporated these elements into their language arts program. The participating school district had recently adopted a focus on writing as a district goal. The advantage of the 6+1 Trait® Writing model is that it has brought together key elements from a number of sources and has presented an integrated approach to teaching and assessing student writing that is supported by instructional materials. The expectation is that this will assist teachers to implement these strategies more effectively.

The results of the analysis of the student achievement data do not provide evidence that the two-day workshop on the 6+1 Trait® Writing model has had a significant impact on improving student achievement in writing in the treatment classes in this study.

Limitations of the Study

There are a number of factors that may help explain why the intervention was not fully implemented in all treatment classrooms. The limitations of the current study relate to the nature of the delivery of the professional development, the length of time for implementation, and the assignment of teachers, rather than schools, to treatment conditions. The length of time for implementation may have affected the degree to which teachers were able to incorporate a significant number of strategies and also the opportunity for students to show large improvements in their writing skills. This shorter amount of time for implementation resulted from a change in location for the conduct of the study, which delayed the training date. The changes in student scores between pretest and posttest were relatively small, which decreased the likelihood of significant differences between groups.

A limitation of the training is that it was delivered in a two-day workshop, with no follow-up sessions. The limitations of this approach are discussed below in Recommendations for Future Research. There were two reasons for taking this approach for training. This is often what has happened in the past with institutes and training in districts, and the expenses would have been large for follow-up sessions. Many school districts are now contracting for follow-up training and/or having district staff members trained who can act as coaches for teachers in the district.

Another factor that may have affected internal validity is the random assignment of teachers, rather than schools, to treatment groups. All schools had some teachers in the experimental group and some in the control group. It was not possible to assign schools to groups because all the grade 6 teachers were in one school, and there were a small number of large schools with grades 3 to 5. One concern associated with this approach is that research has shown that professional development can be more effective when it is

undertaken as a schoolwide initiative. Another concern is the possibility of shared information from teachers in the treatment group with teachers in the control group.

Recommendations for Future Research

The results of this study provide support for the conduct of a larger study over a longer period of time, with follow-up interactions between trainer and teachers.

It would be advisable to build in support structures at the school level following the training, and to extend the implementation time. Six general features have been linked (in varying degrees) to changes in teacher performance and/or student learning in four of the more rigorous studies identified in a literature review (Desimone, et al., 2002; Garet, et al., 2001; Cohen & Hill, 1998; Kennedy, 1998):

- Form of activity—The nature of the professional development activity, spanning a continuum of individual workshop attendance to participation in study groups
- Collective participation and collaboration—The degree to which teachers collaborate to implement what was learned from common professional development
- Content and pedagogical focus—The focus on developing expertise in the subject/content areas teachers teach and in how students learn that subject area
- Active learning—Opportunities for teachers to engage in meaningful analysis of teaching and learning both during and after formal professional development events
- Sustained time and duration—The degree to which the professional development is sustained over time and involves a substantial number of contact hours
- Coherence—The degree to which the activity is aligned with standards and assessments, teachers' goals, and other school improvement efforts

The workshop is often criticized in the literature as not reflecting these key components of effective professional development. Workshops often occur outside the teacher's own classroom and school and are generally scheduled outside regular school time. Incorporation of the features described above is usually dependent on teacher initiative and the presence of supportive school structures (Kennedy, 1998; Cohen & Hill, 1998; Garet, et al., 2001; Desimone, et al., 2002).

For future studies, it would be advisable to include coaches who could provide onsite support for teachers and facilitate a collegial, schoolwide approach to implementation in which teachers receive additional support from teacher team meetings. NWREL is working with some districts that are taking this approach, which is supported by research to be an effective feature of successful professional development. In schools where teachers work with coaches regularly, administrators report substantial growth in levels of collaboration, teacher accountability, and quality of instruction (Symonds, 2003). Coaches are particularly effective when they work with small teams of teachers (Symonds, 2003). There is not a clear advantage to having the coach located in the school

rather than in the district office, as both approaches have advantages that the other does not (Feldman & Tung, 2002; Joyce & Showers, 1995). The training for coaches should incorporate the factors that Neufeld (2002) identified as being important to coaches: time to review, plan, and practice the skills that they will teach to teachers; training targeted to their level; and specific training on coaching skills.

These suggestions should increase the likelihood that teachers would fully implement the intervention and increase the likelihood of impact on student achievement.

REFERENCES

Applebee, A.N. (1986). Problems in process approaches: Toward a reconceptualization of process instruction. In A.R. Petrosky & D. Bartholomae (Eds.), *The teaching of writing: Eighty-fifth yearbook of the National Society for the Study of Education, Part 2* (pp. 95–113). Chicago, IL: University of Chicago Press.

Arter, J.S., Spandel, V., Culham, R., & Pollard, J. (1994, April). *The impact of training students to be self-assessors of writing*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA. (ERIC Document Reproduction Service No. ED370975)

Bellamy, P. (Ed.). (2004). *Picture books: An annotated bibliography with activities for teaching writing with the 6+1 Trait® writing model* (6th ed.). Portland, OR: Northwest Regional Educational Laboratory.

Bissex, G.L. (1980). *Gnys at wrk: A child learns to write and read*. Cambridge, MA: Harvard University Press.

Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: Principles, Policy & Practice, 5*(1), 7–74.

Chomsky, C. (1971). Write first, read later. *Childhood Education, 47*(6), 296–299.

Cohen, D.K., & Hill, H.C. (1998). *Instructional policy and classroom performance: The mathematics reform in California* (CPRE Research Rep. No. RR-390). Philadelphia, PA: University of Pennsylvania, Consortium for Policy Research in Education. Retrieved November 29, 2004, from www.cpre.org/Publications/rr39.pdf

Crooks, T.J. (1988). The impact of classroom evaluation practices on students. *Review of Educational Research, 58*(4), 438–481.

Culham, R. (2003). *6+1 traits of writing: The complete guide.* New York, NY: Scholastic Professional Books.

Darling-Hammond, L. (1999). *Teacher quality and student achievement: A review of state policy evidence*. Seattle, WA: University of Washington, Center for the Study of Teaching and Policy. Retrieved November 29, 2004, from http://depts.washington.edu/ctpmail/PDFs/LDH_1999.pdf

Desimone, L.M., Porter, A.C., Garet, M.S., Yoon, K.S., & Birman, B.F. (2002). Effects of professional development on teachers' instruction: Results from a three-year longitudinal study. *Educational Evaluation and Policy Analysis, 24*(2), 81–112.

Diederich, P.B. (1974). *Measuring growth in English.* Urbana, IL: National Council of Teachers of English.

Diederich, P.B., French, J.W., & Carlton, S.T. (1961). *Factors in judgments of writing ability.* Princeton, NJ: Educational Testing Service.

DiPardo, A., & Freedman S.W. (1988). Peer response groups in the writing classroom: Theoretic foundations and new directions. *Review of Educational Research, 58*(2), 119–149.

Emig, J. (1971). *The composing processes of twelfth graders*. Urbana, IL: National Council of Teachers of English.

Feldman, J., & Tung, R. (2002, April). *The role of external facilitators in whole school reform: Teachers' perceptions of how coaches influence school change.* Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA. (ERIC Document Reproduction Service No. ED470680)

Flower, L.S. (1979). Writer-based prose: A cognitive basis for problems in writing. *College English, 41*(1), 19–37

Flower, L.S., & Hayes, J.R. (1981). A cognitive process theory of writing. *College Composition and Communication, 32*(4), 365–387.

Fontana, D., & Fernandes, M. (1994). Improvements in mathematics performance as a consequence of self-assessment in Portuguese primary school pupils. *British Journal of Educational Psychology, 64*(3), 407–417.

Freedman, S.W., Dyson, A.H., Flower, L., & Chafe, W. (1987). *Research in writing: Past, present, and future* (Technical Rep. No. 1). Berkeley, CA. University of California, Center for the Study of Writing. (ERIC Document Reproduction Service No. ED285205)

Garet, M.S., Porter, A.C., Desimone, L., Birman, B.F., & Yoon, K.S. (2001). What makes professional development effective? Results of a national sample of teachers. *American Educational Research Journal, 38*(4), 915–945.

Graves, D.H. (1983). *Writing: Teachers and children at work.* Exeter, NH: Heinemann Educational Books.

Grundy, T. (1986). The writing program in the Beaverton School District [Entire issue]. *OSSC Bulletin, 30*(2). (ERIC Document Reproduction Service No. ED274104)

Guskey, T.R. (2003). What makes professional development effective? *Phi Delta Kappan, 84*(10), 748–750.

Gwet, K. (2002). *Inter-rater reliability: Dependency on trait prevalence and marginal homogeneity* (SMIRRA Rep. No. 2). Gaithersburg, MD: STATAXIS Consulting. Retrieved November 29, 2004, from www.stataxis.com/files/articles/smirra2.pdf

Hawley, W.D., & Valli, L. (1999). The essentials of effective professional development: A new consensus. In L. Darling-Hammond & G. Sykes (Eds.), *Teaching as the learning profession: Handbook of policy and practice* (pp. 127–150). San Francisco, CA: Jossey-Bass.

Hillocks, G., Jr. (1987). Synthesis of research on teaching writing. *Educational Leadership, 44*(8), 71–76, 78, 80–82.

Hox, J. (2002). *Multilevel analysis: Techniques and applications.* Mahwah, NJ: Lawrence Erlbaum.

International Reading Association & National Association for the Education of Young Children. (1998). *Learning to read and write: Developmentally appropriate practices for young children* [Position statement]. Washington, DC: National Association for the Education of Young Children. Retrieved November 30, 2004, from www.naeyc.org/about/positions/pdf/PSREAD98.PDF

Joyce, B., & Showers, B. (1995*). Student achievement through staff development: Fundamentals of school renewal* (2nd ed.)*.* White Plains, NY: Longman.

Kennedy, M. (1998). *Form and substance in inservice teacher education* (NISE Research Monograph No. 13). Madison, WI: University of Wisconsin-Madison, National Institute for Science Education. Retrieved November 30, 2004, from www.wcer.wisc.edu/nise/Publications/Research_Monographs/vol13.pdf

Marzano, R.J. (2003). *What works in schools: Translating research into action.* Alexandria, VA: Association for Supervision and Curriculum Development.

Mayer, D.P., Mullens, J.E., Moore, M.T., & Ralph, J. (2000). *Monitoring school quality: An indicators report* [Statistical analysis rep.]. Washington, DC: U.S. Department of Education, National Center for Education Statistics. Retrieved November 30, 2004, from http://nces.ed.gov/pubs2001/2001030.pdf

National Commission on Teaching & America's Future. (1996). *What matters most: Teaching for America's future. Report of the National Commission on Teaching & America's Future.* New York, NY: Author.

Natriello, G. (1987). The impact of evaluation processes on students. *Educational Psychologist, 22*(2), 155–175.

Neufeld, B. (with Baldassari, C., Johnson C., Parker, R., & Roper, D.). (2002). Using what we know: Implications for scaling-up implementation of the CCL model. Boston, MA: Education Matters. Retrieved December 14, 2004, from www.edmatters.org/webreports/boston/usingcclfinal.pdf

Newell, G.E. (1998). "How much are we the wiser?" Continuity and change in writing and learning. In N. Nelson & R.C. Calfee (Eds.), *The reading-writing connection: Ninety-seventh yearbook of the National Society for the Study of Education, Part 2* (pp. 178–202). Chicago, IL: University of Chicago Press.

Northwest Regional Educational Laboratory. (1999). *Seeing with new eyes: A guidebook on teaching and assessing beginning writers using the six-trait writing model* (5th ed.)*.* Portland, OR: Author.

Persky, H.R., Daane, M.C., & Jim, Y. (with Davis, S., Jenkins, F., Liu, H., et al.). (2003). *The nation's report card: Writing 2002.* Washington, DC: U.S. Department of Education, National Center for Education Statistics. Retrieved December 1, 2004, from http://nces.ed.gov/nationsreportcard/pdf/main2002/2003529.pdf

Popham, W.J. (2003). The seductive allure of data. *Educational Leadership, 60*(5)*,* 48–51.

Purves, A.C. (Ed.). (1988). *Writing across languages and cultures: Issues in contrastive rhetoric.* Newbury Park, CA: Sage.

Raudenbush, S.W., & Bryk, A.S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Thousand Oaks, CA: Sage.

Rosenholtz, S.J. (1989). *Teachers' workplace: The social organization of schools.* New York, NY: Longman.

Sadler, D.R. (1989). Formative assessment and the design of instructional systems. *Instructional Science*, *18*(2), 119–144.

Shields, P.M., Marsh, J.A., & Adelman, N.E. (1998). *Evaluation of NSF's Statewide Systemic Initiatives (SSI) program: The SSIs' impacts on classroom practice.* Menlo Park, CA: SRI International. Retrieved December 1, 2004, from www.sri.com/policy/cep/pubs/ssi/ssiclass.pdf

Sommers, N. (1980). Revision strategies of student writers and experienced adult writers. *College Composition and Communication, 31*(4), 378–388.

Sommers, N. (1982). Responding to student writing. *College Composition and Communication, 33*(2), 148–156.

Symonds, K.W. (2003). *Literacy coaching: How school districts can support a long-term strategy in a short-term world.* San Francisco, CA: Bay Area School Reform Collaborative. Retrieved December 1, 2004, from www.basrc.org/Pubs&Docs/LiteracyCoaching.pdf

Vygotsky, L.S. (1978). *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

Wenglinsky, H. (2000). *How teaching matters: Bringing the classroom back into discussions of teacher quality.* Princeton, NJ: Educational Testing Service. Retrieved December 1, 2004, from www.mff.org/pubs/ets_mff_study2000.pdf

Zinsser, W. (1988). *Writing to learn.* New York, NY: Harper & Row.

APPENDIX A:
STRATEGIES FOR THE
6+1 TRAIT® WRITING MODEL

The following strategies support the implementation of trait writing in the classroom, and provide the essential link between assessment and instruction. They include activities to encourage the use of picture books to illustrate writing skills, and a system for constructing effective writing prompts.

1. Teaching students **the language** they need to speak and think like writers (the language of the traits) by having them develop scoring guides using student-friendly language

2. Having students **read, score, and justify** scores for anonymous samples of writing, so that they internalize what effective use of a trait looks like and does not look like

3. Having students practice and rehearse **focused revision** strategies by working with a partner or small group, working on an *anonymous* sample to revise for one trait at a time

4. Teaching students to **set writing goals** and continuously monitor their own progress

5. **Reading aloud** printed material of all kinds to illustrate strengths and weaknesses of writing (e.g., using picture books as a teaching tool in writing)

6. Using a variety of **focused lessons** designed to develop skill in a particular trait or criterion; weaving focused trait skill lessons into the curriculum to enhance the writing program

7. Developing thoughtful and explicit **prompts** that include role of writer, audience, format, topic, and a verb that indicate mode or purpose (RAFTS strategy)

8. **Writing** along with students – teachers taking the risk share their "works in progress" with students and asking them for revising feedback

9. Using **Curriculum Mapping and lesson planning** to develop skills and integrate traits into content teaching.

10. Developing strong collegial support through **Professional Learning Teams**.

APPENDIX B:
STUDENT WRITING BOOKLET AND PROMPTS

<div style="border: 1px solid black;">

Student Writing Booklet

Grade 3 Narrative

Your Name _____

Your Class Number_____

</div>

Instructions

1. In this writing assignment you are asked to write a story. Please choose **one** of these topics:

> You are an old poisonous creature living in the wild. Write a story to tell your children about a time when you had to defend yourself against a bigger wild animal.

> ## — OR —

> You are a student. Write a letter telling your pen pal in England what happened when you got lost last summer.

2. Use the next page, called **PLANNING**, to plan and organize your ideas.

3. Write your draft on the pages called **DRAFT**. Please write only on the lines with arrows →.

4. Mark your revisions and editing changes on the same pages called DRAFT. You may write your changes on the lines without arrows.

5. Write your finished copy on the pages called **FINAL COPY**.

PLANNING

Experimental Study on the Impact of the 6+1 Trait[©] Writing Model on Student Achievement in Writing
[©]2004 Northwest Regional Educational Laboratory

DRAFT
Write only on lines with arrows →.

_____

→ _____

_____

→ _____

_____

→ _____

_____

→ _____

_____

→ _____

_____

→ _____

_____

→ _____

_____

→ _____

_____

→ _____

_____

→ _____

FINAL COPY

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

DRAFT
Write only on lines with arrows →.

_____

→ _____

_____

→ _____

_____

→ _____

_____

→ _____

_____

→ _____

_____

→ _____

_____

→ _____

_____

→ _____

_____

→ _____

_____

→ _____

FINAL COPY

Experimental Study on the Impact of the 6+1 Trait[©] Writing Model on Student Achievement in Writing
[©]2004 Northwest Regional Educational Laboratory

All student writing booklets had the format of the Grade 3 Narrative booklet above. Each booklet had two prompts. The writing assessment in grades 3 and 4 consisted of a booklet with narrative prompts and a booklet with descriptive prompts. The prompts were identical for grades 3 and 4.

Descriptive Prompts for Grades 3 and 4

In this writing assignment you are asked to describe something. Please choose **one** of these topics:

> You are an animal keeper at a zoo. Write a letter to a friend describing the animal or bird that you take care of.

— OR —

> You are a school designer. Write a letter to a principal describing the perfect playground for students.

The writing assessment in grades 5 and 6 consisted of a booklet with narrative prompts and a booklet with persuasive prompts. The prompts were identical for grades 5 and 6.

Narrative Prompts for Grades 5 and 6

In this writing assignment you are asked to write a first-person narrative. Please choose one of these topics:

You are an old poisonous creature living in the wild. Write a story to tell your children about a time when you had to defend yourself against a bigger wild animal.

— OR —

You are an inventor. Write a letter to a friend telling him/her what happened the day you tried out the time-machine you just invented.

Experimental Study on the Impact of the 6+1 Trait© Writing Model on Student Achievement in Writing

Persuasive Prompts for Grades 5 and 6

In this writing assignment you are asked to convince someone to do something. Please choose one of these topics:

You are a class representative on your school's student council. Write a letter to your principal persuading him/her that your school needs more, or fewer, classroom pets.

— OR —

You are a member of the student council. Write an article for your school newspaper persuading other students to support your canned food drive for needy families.

APPENDIX C:
SCORING RUBRICS

6+1 Trait® Writing Rubric (Ideas)

5 *This paper is clear and focused. It holds the reader's attention. Relevant anecdotes and details enrich the central theme.*

   A. The topic is narrow and manageable.
   B. Relevant, telling, quality details give the reader important information that goes beyond the obvious or predictable.
   C. Reasonably accurate details are present to support the main ideas.
   D. The writer seems to be writing from knowledge or experience; the ideas are fresh and original.
   E. The reader''s questions are anticipated and answered.
   F. Insight—an understanding of life and a knack for picking out what is significant—is an indicator of high level performance, though not required.

3 *The writer is beginning to define the topic, even though development is still basic or general.*

   A. The topic is fairly broad; however, you can see where the writer is headed.
   B. Support is attempted, but doesn't go far enough yet in fleshing out the key issues or story line.
   C. Ideas are reasonably clear, though they may not be detailed, personalized, accurate, or expanded enough to show in-depth understanding or a strong sense of purpose.
   D. The writer seems to be drawing on knowledge or experience, but has difficulty going from general observations to specifics.
   E. The reader is left with questions. More information is needed to "fill in the blanks."
   F. The writer generally stays on the topic but does not develop a clear theme. The writer has not yet focused the topic past the obvious.

1 *As yet, the paper has no clear sense of purpose or central theme. To extract meaning from the text, the reader must make inferences based on sketchy or missing details. The writing reflects more than one of these problems:*

   A. The writer is still in search of a topic, brainstorming, or has not yet decided what the main idea of the piece will be.
   B. Information is limited or unclear or the length is not adequate for development.
   C. The idea is a simple restatement of the topic or an answer to the question with little or no attention to detail.
   D. The writer has not begun to define the topic in a meaningful, personal way.
   E. Everything seems as important as everything else; the reader has a hard time sifting out what is important.
   F. The text may be repetitive, or may read like a collection of disconnected, random thoughts with no discernible point.

6+1 Trait® Writing Rubric (Organization)

5   *The organization enhances and showcases the central idea or theme. The order, structure, or presentation of information is compelling and moves the reader through the text.*

    A.   An inviting introduction draws the reader in; a satisfying conclusion leaves the reader with a sense of closure and resolution.

    B.   Thoughtful transitions clearly show how ideas connect.

    C.   Details seem to fit where they're placed; sequencing is logical and effective.

    D.   Pacing is well controlled; the writer knows when to slow down and elaborate, and when to pick up the pace and move on.

    E.   The title, if desired, is original and captures the central theme of the piece.

    F.   Organization flows so smoothly the reader hardly thinks about it; the choice of structure matches the purpose and audience.

3   *The organizational structure is strong enough to move the reader through the text without too much confusion.*

    A.   The paper has a recognizable introduction and conclusion. The introduction may not create a strong sense of anticipation; the conclusion may not tie up all loose ends.

    B.   Transitions often work well; at other times, connections between ideas are fuzzy.

    C.   Sequencing shows some logic, but not under control enough that it consistently supports the ideas. In fact, sometimes it is so predictable and rehearsed that the structure takes attention away from the content.

    D.   Pacing is fairly well controlled, though the writer sometimes lunges ahead too quickly or spends too much time on details that do not matter.

    E.   A title (if desired) is present, although it may be uninspired or an obvious restatement of the prompt or topic.

    F.   The organization sometimes supports the main point or storyline; at other times, the reader feels an urge to slip in a transition or move things around.

1   *The writing lacks a clear sense of direction. Ideas, details, or events seem strung together in a loose or random fashion; there is no identifiable internal structure. The writing reflects more than one of these problems:*

    A.   There is no real lead to set up what follows, no real conclusion to wrap things up.

    B.   Connections between ideas are confusing or not even present.

    C.   Sequencing needs lots and lots of work.

    D.   Pacing feels awkward; the writer slows to a crawl when the reader wants to get on with it, and vice versa.

    E.   No title is present (if requested) or, if present, does not match well with the content.

    F.   Problems with organization make it hard for the reader to get a grip on the main point or story line.

6+1 Trait® Writing Rubric (Voice)

5   *The writer speaks directly to the reader in a way that is individual, compelling, and engaging. The writer crafts the writing with an awareness and respect for the audience and the purpose for writing.*

    A. The tone of the writing adds interest to the message and is appropriate for the purpose and audience.

    B. The reader feels a strong interaction with the writer, sensing the person behind the words.

    C. The writer takes a risk by revealing who he or she is consistently throughout the piece.

    D. Expository or persuasive writing reflects a strong commitment to the topic by showing why the reader needs to know this and why he or she should care.

    E. Narrative writing is honest, personal, and engaging and makes you think about, and react to, the author's ideas and point of view.

3   *The writer seems sincere but not fully engaged or involved. The result is pleasant or even personable, but not compelling.*

    A. The writer seems aware of an audience but discards personal insights in favor of obvious generalities.

    B. The writing communicates in an earnest, pleasing, yet safe manner.

    C. Only one or two moments here or there intrigue, delight, or move the reader. These places may emerge strongly for a line or two, but quickly fade away.

    D. Expository or persuasive writing lacks consistent engagement with the topic to build credibility.

    E. Narrative writing is reasonably sincere, but doesn't reflect unique or individual perspective on the topic.

1   *The writer seems indifferent, uninvolved, or distanced from the topic and/or the audience. As a result, the paper reflects more than one of the following problems:*

    A. The writer is not concerned with the audience. The writer's style is a complete mismatch for the intended reader or the writing is so short that little is accomplished beyond introducing the topic.

    B. The writer speaks in a kind of monotone that flattens all potential highs or lows of the message.

    C. The writing is humdrum and "risk-free."

    D. The writing is lifeless or mechanical; depending on the topic, it may be overly technical or jargonistic.

    E. The development of the topic is so limited that no point of view is present—zip, zero, zilch, nada.

6+1 Trait® Writing Rubric (Word Choice)

5 *Words convey the intended message in a precise, interesting, and natural way. The words are powerful and engaging.*

- A. Words are specific and accurate. It is easy to understand just what the writer means.
- B. Striking words and phrases often catch the reader's eye and linger in the reader's mind.
- C. Language and phrasing is natural, effective, and appropriate for the audience.
- D. Lively verbs add energy while specific nouns and modifiers add depth.
- E. Choices in language enhance the meaning and clarify understanding.
- F. Precision is obvious. The writer has taken care to put just the right word or phrase in just the right spot.

3 *The language is functional, even if it lacks much energy. It is easy to figure out the writer's meaning on a general level.*

- A. Words are adequate and correct in a general sense, and they support the meaning by not getting in the way.
- B. Familiar words and phrases communicate but rarely capture the reader's imagination.
- C. Attempts at colorful language show a willingness to stretch and grow but sometimes reach beyond the audience (thesaurus overload!).
- D. Despite a few successes, the writing is marked by passive verbs, everyday nouns, and mundane modifiers.
- E. The words and phrases are functional with only one or two fine moments.
- F. The words may be refined in a couple of places, but the language looks more like the first thing that popped into the writer's mind.

1 *The writer demonstrates a limited vocabulary or has not searched for words to convey specific meaning.*

- A. Words are so nonspecific and distracting that only a very limited meaning comes through.
- B. Problems with language leave the reader wondering. Many of the words just don't work in this piece.
- C. Audience has not been considered. Language is used incorrectly, making the message secondary to the misfires with the words.
- D. Limited vocabulary and/or misused parts of speech seriously impair understanding.
- E. Words and phrases are so unimaginative and lifeless that they detract from the meaning.
- F. Jargon or clichés distract or mislead. Redundancy may distract the reader.

6+1 Trait® Writing Rubric (Sentence Fluency)

5 *The writing has an easy flow, rhythm, and cadence. Sentences are well built, with strong and varied structure that invites expressive oral reading.*

A. Sentences are constructed in a way that underscores and enhances the meaning.
B. Sentences vary in length as well as structure. Fragments, if used, add style. Dialogue, if present, sounds natural.
C. Purposeful and varied sentence beginnings add variety and energy.
D. The use of creative and appropriate connectives between sentences and thoughts shows how each relates to, and builds upon, the one before it.
E. The writing has cadence; the writer has thought about the sound of the words as well as the meaning. The first time you read it aloud is a breeze.

3 *The text hums along with a steady beat, but tends to be more pleasant or businesslike than musical, more mechanical than fluid.*

A. Although sentences may not seem artfully crafted or musical, they get the job done in a routine fashion.
B. Sentences are usually constructed correctly; they hang together; they are sound.
C. Sentence beginnings are not ALL alike; some variety is attempted.
D. The reader sometimes has to hunt for clues (e.g., connecting words and phrases like *however, therefore, naturally, after a while, on the other hand, to be specific, for example, next, first of all, later, but as it turned out, although,* etc.) that show how sentences interrelate.
E. Parts of the text invite expressive oral reading; others may be stiff, awkward, choppy, or gangly.

1 *The reader has to practice quite a bit in order to give this paper a fair interpretive reading. The writing reflects more than one of the following problems:*

A. Sentences are choppy, incomplete, rambling or awkward; they need work. Phrasing does not sound natural. The patterns may create a sing-song rhythm, or a chop-chop cadence that lulls the reader to sleep.
B. There is little to no "sentence sense" present. Even if this piece was flawlessly edited, the sentences would not hang together.
C. Many sentences begin the same way—and may follow the same patterns (e.g., *subject-verb-object*) in a monotonous pattern.
D. Endless connectives (*and, and so, but then, because, and then,* etc.) or a complete lack of connectives create a massive jumble of language.
E. The text does not invite expressive oral reading.

6+1 Trait® Writing Rubric (Conventions)

5 *The writer demonstrates a good grasp of standard writing conventions (e.g., spelling, punctuation, capitalization, grammar, usage, paragraphing) and uses conventions effectively to enhance readability. Errors tend to be so few that just minor touch-ups would get this piece ready to publish.*

A. Spelling is generally correct, even on more difficult words.
B. The punctuation is accurate, even creative, and guides the reader through the text.
C. A thorough understanding and consistent application of capitalization skills are present.
D. Grammar and usage are correct and contribute to clarity and style.
E. Paragraphing tends to be sound and reinforces the organizational structure.
F. The writer may manipulate conventions for stylistic effect—and it works! The piece is very close to being ready to publish.

GRADES 7 AND UP ONLY: The writing is sufficiently complex to allow the writer to show skill in using a wide range of conventions. For writers at younger ages, the writing shows control over those conventions that are grade/age appropriate.

3 *The writer shows reasonable control over a limited range of standard writing conventions. Conventions are sometimes handled well and enhance readability; at other times, errors are distracting and impair readability.*

A. Spelling is usually correct or reasonably phonetic on common words, but more difficult words are problematic.
B. End punctuation is usually correct; internal punctuation (*commas, apostrophes, semicolons, dashes, colons, parentheses*) is sometimes missing/wrong.
C. Most words are capitalized correctly; control over more sophisticated capitalization skills may be spotty.
D. Problems with grammar or usage are not serious enough to distort meaning but may not be correct or accurately applied all of the time.
E. Paragraphing is attempted but may run together or begin in the wrong places.
F. Moderate editing (a little of this, a little of that) would be required to polish the text for publication.

1 *Errors in spelling, punctuation, capitalization, usage, and grammar and/or paragraphing repeatedly distract the reader and make the text difficult to read. The writing reflects more than one of these problems:*

A. Spelling errors are frequent, even on common words.
B. Punctuation (including terminal punctuation) is often missing or incorrect.
C. Capitalization is random and only the easiest rules show awareness of correct use.
D. Errors in grammar or usage are very noticeable, frequent, and affect meaning.
E. Paragraphing is missing, irregular, or so frequent (every sentence) that it has no relationship to the organizational structure of the text.
F. The reader must read once to decode, then again for meaning. Extensive editing (virtually every line) would be required to polish the text for publication.

Holistic Scoring Rubric*

6	The paper contains a clear controlling idea that specifically addresses the prompt and that may reveal complexity, variety, and freshness of thought. The organization contains evidence of beginning, middle, and end, progresses logically, uses appropriate transitions, and indicates a distinction between main and subordinate ideas. Sentences vary in structure and complexity while being clear in meaning. Errors in grammar, diction, and mechanics are few, if any.
5	The paper contains a clear controlling idea that specifically addresses the prompt. The organization has a beginning, middle, and end that is related to the controlling idea and may include some transitions. The development explains and supports the ideas although the relationship between the example and the idea may be somewhat obscure. Most sentences are clear and vary in structure. Errors in grammar, diction, and mechanics are few.
4	The paper contains a competent controlling idea with a sense of direction and adequately addresses the prompt. The organization has a beginning, middle, and end that may be formulaic. The development explains and supports the ideas although both the organization and development may be disjointed in places. Most sentences are clear while they may lack variety and complexity. Errors in grammar, diction, and mechanics may be distracting.
3	The paper suggests a controlling idea that may not be supported, but it does address the prompt. The organization has some evidence of a beginning, middle, and end. The development may weakly explain and support the controlling idea or may not directly relate to it. Although the meaning of most sentences is fairly clear, errors in grammar, diction, and mechanics may impede understanding.
2	Although addressing the prompt, the paper may contain several ideas, any one of which could have been a controlling idea, or it may have a controlling idea that is not developed. The organization may contain some evidence of beginning, middle, and end or may tend toward a simple listing of ideas, few of which are developed. Errors in grammar, diction, and mechanics may impede understanding.
1	The paper may lack a controlling idea or may only momentarily address the prompt. The organization lacks a sense of beginning, middle, and end. The development, if any, may not support the ideas or may digress to unrelated topics. Errors in grammar, diction, and mechanics severely impede understanding.
0	The student did not attempt the prompt or nothing was written in the final draft section of the form.
N/S	The written response is unreadable or so off-task that it cannot be scored.

Experimental Study on the Impact of the 6+1 Trait© Writing Model on Student Achievement in Writing
©2004 Northwest Regional Educational Laboratory

APPENDIX D:
RESULTS OF TEACHER SURVEY

Teachers were asked to report practices from November to June.

Questions 1 to 6, 15 to 18, and 20 were answered by teachers in both the treatment and control groups. Results for teachers in the treatment group are reported under T and results for teachers in the control group are reported under C. There were 34 teacher surveys for each group. Only teachers in the treatment group answered questions 7 to 14, and 19, which are about 6+1 Trait® Writing.

1. What grade do you teach?

Percent of Teachers

C	T	
26%	26%	a) 3
26%	26%	b) 4
26%	24%	c) 5
21%	24%	d) 6

2. How many writing assignments have your students completed during the period of November 2003 to May 2004?

a) 1
b) 2
c) 3
d) 4
e) 5
f) more than 5

> *Most of the teachers in both groups reported that their students completed more than five writing assignments (91% in the control group and 97% in the treatment group).*

3. When students complete writing assignments, how often do you ask them to do the following?	*Percent of Teachers Selecting Each Response*							
	Every writing assignment		Most writing assignments		Some writing assignments		Never or almost never	
	C	T	C	T	C	T	C	T
a. Participate in prewriting activities	50%	50%	47%	41%	3%	9%	0%	0%
b. Write drafts	50%	59%	35%	27%	14%	12%	3%	0%
c. Revise drafts	41%	56%	47%	32%	11%	12%	0%	0%
d. Participate in peer revision	11%	15%	38%	38%	35%	44%	14%	3%
e. Edit their own writing	41%	56%	41%	32%	17%	12%	0%	0%
f. Prepare a polished (published) copy	27%	35%	50%	50%	24%	15%	0%	0%

C = Control Group, T = Treatment Group

4. How much specific instruction have you given in each of the following to help your students improve their writing?	Percent of Teachers Selecting Each Response							
	A great deal		A moderate amount		A little		None	
	C	T	C	T	C	T	C	T
a. Generating rich ideas and content	49%	41%	52%	50%	0%	9%	0%	0%
b. Organizing content effectively	65%	53%	32%	41%	3%	6%	0%	0%
c. Using effective language	50%	44%	47%	38%	3%	15%	0%	3%
d. Connecting with the reader	24%	18%	62%	59%	15%	21%	0%	3%
e. Using conventions correctly	56%	50%	35%	50%	9%	0%	0%	0%
f. Using effective strategies for revising writing	47%	21%	41%	62%	11%	18%	0%	0%

C = Control Group, T = Treatment Group

5. How often do you do each of the following in your writing instruction?	Percent of Teachers Selecting Each Response							
	Very frequently		Frequently		Occasionally		Not at all	
	C	T	C	T	C	T	C	T
a. Use rubrics to explain what is expected	32%	38%	32%	47%	35%	12%	0%	3%
b. Use samples of student writing to show excellent qualities in writing	18%	35%	41%	38%	38%	24%	3%	3%
c. Ask students to compare their writing with samples of excellent writing	12%	3%	24%	47%	59%	45%	6%	9%
d. Ask students to discuss specific features of their writing	9%	24%	42%	35%	46%	32%	3%	9%

C = Control Group, T = Treatment Group

6. Approximately how long do your students spend on each of the following activities for a typical writing assignment?	Mean Teacher Response (Number of Minutes)	
	C	T
a. Participate in prewriting activities	20 min.	20 min.
b. Write drafts	35 min.	44 min.
c. Revise drafts	24 min.	23 min.
d. Participate in peer revision	17 min.	16 min.
e. Edit their own writing	17 min.	15 min.
f. Prepare a polished (published) copy	33 min.	32 min.

C = Control Group, T = Treatment Group

7. How much specific instruction have you given in each of the following traits?	Percent of Teachers in the Treatment Group Selecting Each Response			
	A great deal	A moderate amount	A little	None
a. Ideas	38%	53%	9%	0%
b. Organization	47%	44%	6%	3%
c. Voice	16%	48%	19%	16%
d. Word choice	34%	44%	22%	0%
e. Sentence fluency	25%	53%	13%	9%
f. Conventions	31%	59%	6%	3%
g. Presentation	13%	41%	41%	6%

Experimental Study on the Impact of the 6+1 Trait© Writing Model on Student Achievement in Writing
©2004 Northwest Regional Educational Laboratory

Circle a number to indicate the extent to which you agree or disagree with each statement.	Percent of Teachers in the Treatment Group Selecting Each Response				
	SA	A	U	D	SD
8. My students developed a good understanding of the traits.	16%	69%	6%	6%	3%
9. My students were able to use the traits to improve their writing.	13%	63%	22%	3%	0%
10. Even the most challenged writers in my class were able to use the traits.	16%	47%	34%	3%	0%
11. My students were able to use the traits effectively in peer revision.	3%	50%	28%	16%	3%
12. My students were able to use the rubrics effectively to do self-assessment.	13%	56%	25%	6%	0%
13. My students with learning disabilities used the trait structure to scaffold their work.	10%	7%	32%	36%	16%

SA = Strongly agree, A = Agree, U = Uncertain, D = Disagree, SD = Strongly disagree

14. As a result of the training in the 6+1 Trait® Writing model:	Percent of Teachers in the Treatment Group Selecting Each Response				
	SA	A	U	D	SD
a. I improved my overall skill in writing instruction and assessment	26%	58%	13%	3%	0%
b. I have a better understanding of the qualities of good writing	36%	55%	7%	3%	0%
c. I am able to explain the qualities of good writing to students more effectively	29%	61%	7%	3%	0%
d. I give more effective feedback to students for improving their writing	36%	45%	16%	3%	0%
e. I communicate more effectively with parents about student writing	19%	36%	45%	0%	0%
f. My students have a more positive attitude toward writing	23%	40%	30%	7%	0%

SA = Strongly agree, A = Agree, U = Uncertain, D = Disagree, SD = Strongly disagree

15. Give a brief description of how you approach the teaching of writing.

Teacher comments addressed teaching practices, writing practices, types of writing, teacher attitude toward the teaching of writing, and aspects of assessment. The largest portion of the comments dealt with the writing process, including 12 teachers who mentioned modeling this process for students. Twelve teachers discussed purposes and goals for writing, and 13 mentioned the need to have students write in a variety of genres. Approximately one-quarter of the teachers addressed aspects of assessment such as the use of rubrics and defining expectations. Five to 10 teachers commented on the overall importance of writing, the importance of fostering student enjoyment in writing, the importance of linking writing to daily life, and the importance of writing as a means of self-expression.

Most responses were quite general in nature, and responses from teachers in the treatment group were similar to those from teachers in the control group. Seven teachers in the treatment group mentioned the traits, and a few connected their

responses to this question with their responses to question 19, which was specifically about the traits.

16. Describe the process that your students use for pre-writing.

The comments addressed generating ideas, planning, and direct teacher assistance. For generating ideas, more than three-quarters of the teachers mentioned brainstorming or large-group discussion. About 10 percent mentioned the use of literature and small-group discussions. The most frequently mentioned planning activity was graphic organizers, which was mentioned by about one-third of the teachers. About 10 percent of the teachers mentioned the four-square organizer, word lists, paper outlines, notes, and story webs. Direct teacher aid was mentioned by about 10 percent of the teachers and consisted of adding details such as vocabulary, introducing or explaining the topic, and modeling processes.

The patterns of responses were not different for teachers in the treatment and control groups.

17. Describe the process that students use for revising their writing.

The comments addressed peer assistance, independent student work, teacher assistance, and resources, each of which was mentioned by half to two-thirds of the teachers. The majority of the comments on peer assistance involved peer conferences, but peer editing and peers reading each other's writing were also mentioned. Independent student work involved the students rereading their own writing and making changes, sometimes for specific features such as adding vocabulary or checking the accuracy of conventions. Nearly half the comments on teacher assistance were about student-teacher conferences. Approximately half the comments on resources described various checklists for making revisions; approximately 10 percent of the teachers also mentioned the use of a dictionary or thesaurus.

The patterns of responses were not different for teachers in the treatment and control groups.

18. Describe the process that students use for editing their writing.

The majority of the comments referred to students making corrections independently and peer editing, which were mentioned by about half and one-third of the teachers, respectively. More than one-third of the teachers mentioned that their students followed specified steps for editing. A bit more than 10 percent of teachers mentioned the use of a dictionary, a spell checker, editing checklists, wall posters for reminders, student-teacher conferences, and color codes to identify types of errors in conventions.

The patterns of responses were not different for teachers in the treatment and control groups.

19. Describe the typical process that you followed to provide specific instruction in the traits.

This question was answered only by teachers in the treatment group. Teachers mentioned specific strategies and materials from the training package for the 6+1 Trait® Writing model. About half the teachers commented on the importance of student practice with the traits, on providing feedback to students, and on using large numbers of examples. More than half the teachers said that they used the student writing samples. Ten to 20 percent of the teachers mentioned the use of children's literature for examples of the traits, the descriptors of the traits in "kid language," and the rubrics. Most of the teacher responses addressed individual aspects of 6+ 1Trait® Writing, but a few teachers gave comprehensive descriptions of the incorporation of the traits model into their writing program. Following is one example:

> *I usually spring-board off a reading piece, pointing out a technique or trait that the author used. Sometimes I read aloud one of the books mentioned as an example of the trait, then read student writing samples before having my students write. Another approach is to have students do a Quick Write, read student writing samples or a book to illustrate a trait, and have the students revise their piece for that trait. I also follow a set of steps for each trait:*
>
> * *Discuss the rubric for one trait*
> * *Read a picture book using that trait*
> * *Have students score student writing samples using the rubric, and explain why they decided to give that score*
> * *Have students do a Quick Write with a focus on that trait*

20. Additional comments.

Very few teachers responded to this question, and no new information was provided.

Thank you for completing this survey.

APPENDIX E:
CLASSROOM OBSERVATION PROTOCOL

Classroom-Level Indicators

1. Is there evidence that writing is actively being taught in the classroom? Is student writing displayed? Do walls, newsletters, etc., show examples of student writing?

   Is there evidence of this indicator?   Yes   No

   Comments:………………………………………………………………………
   …………………………………………………………………………………
   …………………………………………………………………………………

2. Do students know and can they talk about the 6+1 Traits? Do they use "trait vocabulary" appropriately and across the curriculum? Can they tell you about their own writing, or that of a peer, using 6+1 Trait concepts and language?

   Is there evidence of this indicator?   Yes   No

   Comments:………………………………………………………………………
   …………………………………………………………………………………
   …………………………………………………………………………………

3. Are the 6+1 Traits and age-appropriate rubrics easily available and/or posted in the classroom?

   Is there evidence of this indicator?   Yes   No

   Comments:………………………………………………………………………
   …………………………………………………………………………………
   …………………………………………………………………………………

4. Is there evidence that children are reflecting peer and group review of their own and others' writing, using the traits?

   Is there evidence of this indicator?   Yes   No

   Comments:………………………………………………………………………
   …………………………………………………………………………………
   …………………………………………………………………………………

5. Is the teacher using evidence from scored writing samples to meet the needs of individual writers?

   Is there evidence of this indicator?   Yes   No

   Comments:………………………………………………………………………
   …………………………………………………………………………………
   …………………………………………………………………………………

6. Do the teacher and students have systems in place that help them to store and organize writing, and that also encourage students to keep track of individual growth (e.g., student folders or portfolios)?

   Is there evidence of this indicator?   **Yes**   **No**
   Comments:…………………………………………………………………………
   ……………………………………………………………………………………
   ……………………………………………………………………………………

7. Do the teacher and aide/assistant recognize that writing is a process, not an event?

   Is there evidence of this indicator?   **Yes**   **No**
   Comments:…………………………………………………………………………
   ……………………………………………………………………………………
   ……………………………………………………………………………………

8. Does the teacher make an effort to communicate the 6+1 traits to parents and community members?

   Is there evidence of this indicator?   **Yes**   **No**
   Comments:…………………………………………………………………………
   ……………………………………………………………………………………
   ……………………………………………………………………………………

9. Are sample activities in the training notebooks or other sources being implemented?

   Is there evidence of this indicator?   **Yes**   **No**
   Comments:…………………………………………………………………………
   ……………………………………………………………………………………
   ……………………………………………………………………………………

10. Does the teacher use appropriate Trait language in lessons and student feedback situations?

    Is there evidence of this indicator?   **Yes**   **No**
    Comments:…………………………………………………………………………
    ……………………………………………………………………………………
    ……………………………………………………………………………………

School-Level Indicators

11. Is there evidence that the 6+1 traits are being implemented across the grades and across content areas, not just at levels that are being assessed by districts?

    Is there evidence of this indicator?   Yes   No

    Comments:………………………………………………………………………………

    ………………………………………………………………………………………………

    ………………………………………………………………………………………………

12. Are opportunities for teacher sharing and support facilitated?

    Is there evidence of this indicator?   Yes   No

    Comments:………………………………………………………………………………

    ………………………………………………………………………………………………

    ………………………………………………………………………………………………

13. Are instructional and support staff provided opportunities to receive "basic training," updates, and/or advanced implementation training through systematic, planned, staff development approaches?

    Is there evidence of this indicator?   Yes   No

    Comments:………………………………………………………………………………

    ………………………………………………………………………………………………

    ………………………………………………………………………………………………

14. Are teachers working or encouraged to work in teams to implement the traits through peer support groups?

    Is there evidence of this indicator?   Yes   No

    Comments:………………………………………………………………………………

    ………………………………………………………………………………………………

    ………………………………………………………………………………………………

15. Do teachers have opportunities to collaboratively score and discuss student work?

    Is there evidence of this indicator?   Yes   No

    Comments:………………………………………………………………………………

    ………………………………………………………………………………………………

    ………………………………………………………………………………………………

Results are not reported because of the small number of visits. In the nine classrooms that were observed, a wide range of levels of implementation was noted.

APPENDIX F:
STUDENT ACHIEVEMENT RESULTS AND ESTIMATES OF TREATMENT EFFECTS

The tables in this appendix present the pretest and posttest means and standard deviations for the holistic score and the six trait scores for the treatment and control groups at each grade level. The number of students in each group is included in the tables. The population estimates for the treatment effects for each grade are presented below each table of means.

Results for the Holistic Score for Treatment and Control Groups by Grade

Grade	Test Time	Treatment Group			Control Group		
		N	Mean	SD	N	Mean	SD
3	Pre	199	3.42	0.846	225	3.57	0.822
	Post	199	3.83	0.871	225	3.90	0.828
4	Pre	207	3.89	0.800	212	3.96	0.849
	Post	207	4.16	0.741	212	4.24	0.812
5	Pre	177	3.70	0.681	209	3.75	0.749
	Post	177	4.03	0.722	209	3.96	0.682
6	Pre	193	4.14	0.751	170	4.28	0.686
	Post	193	4.44	0.761	170	4.44	0.760

Estimate of Treatment Effect for Holistic Posttest Score

Grade	Estimate	Std. Error	df	t	Sig.
3	0.068	0.107	17.3	0.64	0.530
4	0.111	0.118	17.8	0.94	0.361
5	-0.047	0.095	14.5	-0.50	0.625
6	0.009	0.145	6.7	0.06	0.952

Results for the Analytical Score (Ideas)
for Treatment and Control Groups by Grade

Grade	Test Time	Treatment Group			Control Group		
		N	Mean	SD	N	Mean	SD
3	Pre	199	3.42	0.747	225	3.45	0.702
	Post	199	3.64	0.720	225	3.75	0.614
4	Pre	207	3.39	0.550	212	3.43	0.558
	Post	207	3.58	0.502	212	3.59	0.594
5	Pre	177	3.45	0.661	209	3.43	0.628
	Post	177	3.63	0.605	209	3.60	0.588
6	Pre	193	3.43	0.531	170	3.48	0.586
	Post	193	3.67	0.630	170	3.62	0.579

Estimate of Treatment Effect for the Analytical Trait (Ideas) Posttest Score

Grade	Estimate	Std. Error	df	t	Sig.
3	0.116	0.092	17.4	1.26	0.225
4	0.003	0.082	17.7	0.04	0.968
5	-0.022	0.079	15.2	-0.28	0.784
6	-0.009	0.130	3.7	-0.07	0.951

Results for the Analytical Score (Organization) for Treatment and Control Groups by Grade

Grade	Test Time	Treatment Group			Control Group		
		N	Mean	SD	N	Mean	SD
3	Pre	199	2.95	0.720	225	3.02	0.650
	Post	199	3.61	0.735	225	3.32	0.658
4	Pre	207	3.06	0.504	212	3.08	0.469
	Post	207	3.25	0.459	212	3.30	0.497
5	Pre	177	3.14	0.534	209	3.08	0.562
	Post	177	3.25	0.584	209	3.17	0.601
6	Pre	193	3.19	0.423	170	3.23	0.522
	Post	193	3.31	0.509	170	3.30	0.469

Estimate of Treatment Effect for the Analytical Trait (Organization) Posttest Score

Grade	Estimate	Std. Error	df	t	Sig.
3	0.161	0.101	17.1	1.59	0.131
4	0.034	0.079	18.0	0.43	0.672
5	-0.074	0.079	14.9	-0.95	0.359
6	-0.008	0.089	6.1	-0.09	0.929

**Results for the Analytical Score (Voice)
for Treatment and Control Groups by Grade**

Grade	Test Time	Treatment Group			Control Group		
		N	Mean	SD	N	Mean	SD
3	Pre	199	3.42	0.721	225	3.48	0.637
	Post	199	3.67	0.740	225	3.76	0.638
4	Pre	207	3.34	0.477	212	3.43	0.462
	Post	207	3.57	0.454	212	3.59	0.542
5	Pre	177	3.67	0.609	209	3.68	0.589
	Post	177	3.84	0.592	209	3.66	0.574
6	Pre	193	3.60	0.479	170	3.60	0.570
	Post	193	3.77	0.521	170	3.73	0.531

Estimate of Treatment Effect for the Analytical Trait (Voice) Posttest Score

Grade	Estimate	Std. Error	df	t	Sig.
3	0.067	0.095	17.1	0.71	0.488
4	0.004	0.063	17.1	0.06	0.951
5	-0.162	0.078	9.1	-2.08	0.067
6	-0.036	0.071	10.3	-0.51	0.618

Results for the Analytical Score (Word Choice)
for Treatment and Control Groups by Grade

Grade	Test Time	Treatment Group			Control Group		
		N	Mean	SD	N	Mean	SD
3	Pre	199	3.26	0.625	225	3.29	0.571
	Post	199	3.42	0.657	225	3.56	0.576
4	Pre	207	3.06	0.312	212	3.14	0.311
	Post	207	3.21	0.358	212	3.23	0.400
5	Pre	177	3.37	0.520	209	3.36	0.484
	Post	177	3.44	0.508	209	3.41	0.517
6	Pre	193	3.24	0.415	170	3.31	0.459
	Post	193	3.38	0.490	170	3.39	0.481

Estimate of Treatment Effect for the Analytical Trait (Word Choice) Posttest Score

Grade	Estimate	Std. Error	df	t	Sig.
3	0.115	0.073	16.9	1.58	0.133
4	0.011	0.040	16.8	0.27	0.794
5	-0.043	0.082	15.1	-0.52	0.608
6	0.004	0.065	12.3	0.07	0.948

Results for the Analytical Score (Sentence Fluency)
for Treatment and Control Groups by Grade

Grade	Test Time	Treatment Group			Control Group		
		N	Mean	SD	N	Mean	SD
3	Pre	199	3.13	0.758	225	3.12	0.679
	Post	199	3.38	0.751	225	3.44	0.676
4	Pre	207	3.15	0.428	212	3.16	0.456
	Post	207	3.31	0.466	212	3.30	0.502
5	Pre	177	3.33	0.584	209	3.29	0.553
	Post	177	3.39	0.619	209	3.34	0.628
6	Pre	193	3.32	0.476	170	3.34	0.545
	Post	193	3.41	0.509	170	3.47	0.502

Estimate of Treatment Effect
for the Analytical Trait (Sentence Fluency) Posttest Score

Grade	Estimate	Std. Error	df	t	Sig.
3	0.669	0.105	14.6	0.65	0.524
4	-0.016	0.068	14.8	-0.24	0.817
5	-0.055	0.056	5.5	-0.98	0.367
6	Analysis did not converge.				

Results for the Analytical Score (Conventions)
for Treatment and Control Groups by Grade

Grade	Test Time	Treatment Group			Control Group		
		N	Mean	SD	N	Mean	SD
3	Pre	199	2.88	0.914	225	2.89	0.835
	Post	199	3.18	0.922	225	3.25	0.898
4	Pre	207	3.06	0.654	212	3.05	0.647
	Post	207	3.23	0.655	212	3.22	0.711
5	Pre	177	3.15	0.742	209	3.20	0.721
	Post	177	3.25	0.746	209	3.21	0.726
6	Pre	193	3.18	0.660	170	3.22	0.690
	Post	193	3.33	0.656	170	3.31	0.673

Estimate of Treatment Effect for the Analytical Trait (Conventions) Posttest Score

Grade	Estimate	Std. Error	df	t	Sig.
3	0.107	0.111	12.4	0.97	0.351
4	0.044	0.085	6.0	0.51	0.626
5	-0.032	0.085	15.1	-0.38	0.710
6	0.004	0.072	13.0	0.06	0.957

APPENDIX G:
LINEAR MIXED MODEL ANALYSIS TABLES

Grade 3 Holistic Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.831	0.077	17.4	49.48	0.000
Treatment Condition	0.068	0.107	17.3	0.64	0.530
Within Class Slope	0.574	0.065	19.3	8.81	0.000

Grade 3 Ideas Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.638	0.067	17.5	54.56	0.000
Treatment Condition	0.116	0.092	17.4	1.26	0.225
Within Class Slope	0.452	0.045	16.1	9.98	0.000

Grade 3 Organization Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.161	0.073	17.2	43.09	0.000
Treatment Condition	0.160	0.101	17.0	1.59	0.131
Within Class Slope	0.433	0.045	409.0	9.57	0.000

Grade 3 Voice Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.678	0.070	17.7	52.78	0.000
Treatment Condition	0.067	0.095	17.1	0.71	0.488
Within Class Slope	0.409	0.074	17.4	5.51	0.000

Grade 3 Word Choice Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.434	0.053	17.5	64.67	0.000
Treatment Condition	0.115	0.073	16.9	1.58	0.133
Within Class Slope	0.517	0.047	9.2	10.94	0.000

Grade 3 Sentence Fluency Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.377	0.077	15.4	43.74	0.000
Treatment Condition	0.069	0.105	14.6	0.65	0.524
Within Class Slope	0.491	0.044	12.2	11.13	0.000

Grade 3 Conventions Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.157	0.083	14.9	38.26	0.000
Treatment Condition	0.107	0.111	12.4	0.97	0.351
Within Class Slope	0.744	0.040	422.2	18.74	0.000

Grade 4 Holistic Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	4.149	0.084	18.1	49.25	0.000
Treatment Condition	0.111	0.118	17.8	0.94	0.361
Within Class Slope	0.520	0.047	15.7	11.14	0.000

Grade 4 Ideas Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.584	0.058	18.1	61.50	0.000
Treatment Condition	0.003	0.082	17.7	0.04	0.968
Within Class Slope	0.352	0.051	7.3	6.93	0.000

Grade 4 Organization Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.261	0.056	18.2	57.88	0.000
Treatment Condition	0.034	0.079	18.0	0.43	0.672
Within Class Slope	0.230	0.048	9.6	4.78	0.001

Grade 4 Voice Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.581	0.045	17.9	79.4	0.000
Treatment Condition	0.004	0.063	17.1	0.06	0.951
Within Class Slope	0.260	0.060	12.4	4.32	0.001

Grade 4 Word Choice Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.217	0.029	17.5	111.42	0.000
Treatment Condition	0.011	0.040	16.8	0.27	0.794
Within Class Slope	0.408	0.094	17.1	4.35	0.00

Grade 4 Sentence Fluency Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.318	0.048	15.0	68.83	0.000
Treatment Condition	-0.016	0.068	14.8	-0.24	0.817
Within Class Slope	0.402	0.052	401.2	7.75	0.000

Grade 4 Conventions Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.207	0.066	10.0	48.92	0.000
Treatment Condition	0.044	0.085	6.0	0.51	0.626
Within Class Slope	0.666	0.049	10.6	13.45	0.000

Grade 5 Holistic Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	4.011	0.070	15.2	57.29	0.00
Treatment Condition	-0.047	0.095	14.5	-0.50	0.625
Within Class Slope	0.490	0.053	14.8	9.18	0.000

Grade 5 Ideas Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.622	0.058	15.6	62.56	0.000
Treatment Condition	-0.022	0.079	15.2	-0.28	0.784
Within Class Slope	0.415	0.047	15.1	8.88	0.000

Grade 5 Organization Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.245	0.058	15.3	56.39	0.000
Treatment Condition	-0.074	0.079	14.9	-0.95	0.359
Within Class Slope	0.508	0.067	15.3	7.63	0.000

Grade 5 Voice Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.831	0.058	10.1	65.90	0.000
Treatment Condition	-0.162	0.078	9.1	-2.08	0.067
Within Class Slope	0.409	0.051	9.9	7.98	0.000

Grade 5 Word Choice Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.448	0.060	15.8	57.29	0.000
Treatment Condition	-0.043	0.082	15.1	-0.52	0.608
Within Class Slope	0.353	0.076	13.9	4.62	0.000

Grade 5 Sentence Fluency Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.392	0.041	5.7	81.81	0.000
Treatment Condition	-0.055	0.056	5.5	-0.98	0.367
Within Class Slope	0.498	0.072	16.4	6.95	0.00

Grade 5 Conventions Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.243	0.062	15.5	52.09	0.000
Treatment Condition	-0.032	0.085	15.1	-0.38	0.710
Within Class Slope	0.679	0.043	14.5	15.81	0.000

Grade 6 Holistic Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	4.432	0.103	9.2	42.90	0.000
Treatment Condition	0.009	0.145	6.7	0.06	0.952
Within Class Slope	0.494	0.053	487.7	9.40	0.000

Grade 6 Ideas Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.649	0.091	6.4	39.97	0.000
Treatment Condition	-0.009	0.130	3.7	-0.07	0.951
Within Class Slope	0.255	0.057	282.1	4.44	0.000

Grade 6 Organization Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.313	0.061	6.7	54.28	0.000
Treatment Condition	-0.008	0.089	6.1	-0.09	0.929
Within Class Slope	0.245	0.054	363.0	4.53	0.000

Grade 6 Voice Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.767	0.049	10.3	77.64	0.000
Treatment Condition	-0.036	0.071	10.3	-0.51	0.618
Within Class Slope	0.152	0.054	344.3	2.83	0.005

Grade 6 Word Choice Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.386	0.044	12.5	76.42	0.000
Treatment Condition	0.004	0.065	12.3	0.07	0.948
Within Class Slope	0.144	0.064	13.5	2.26	0.041

Grade 6 Sentence Fluency Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept					
Treatment Condition	Analysis did not converge.				
Within Class Slope					

Grade 6 Conventions Posttest Score: Estimates of Fixed Effects

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	3.321	0.051	13.9	64.58	0.000
Treatment Condition	0.004	0.072	13.0	0.06	0.957
Within Class Slope	0.584	0.063	16.3	9.34	0.000

More About NWREL

Mission

The mission of the Northwest Regional Educational Laboratory (NWREL) is to improve educational results for children, youth, and adults by providing research and development assistance in delivering equitable, high-quality educational programs. A private, nonprofit corporation, NWREL provides research and development assistance to education, government, community agencies, business, and labor. NWREL (www.nwrel.org) is part of a national network of 10 regional educational laboratories (www.relnetwork.org) funded by the U.S. Department of Education, Institute of Education Sciences (IES). NWREL's primary service area is the Northwest region of Alaska, Idaho, Montana, Oregon, and Washington. Now in its fourth decade, NWREL reaffirms the belief that strong public schools, strong communities, strong families, and strong children make a strong nation. We further believe that every student must have equal access to high-quality education and the opportunity to succeed, and that strong schools ensure equity and excellence for all students.

Priorities for Educational Improvement

Focusing on priority educational needs in the region, NWREL is organized into four major centers of expertise to conduct long-term research and development and technical assistance activities: Center for Classroom Teaching and Learning; Center for School, Family, and Community; Center for School and District Improvement; and Center for Research, Evaluation, and Assessment.

Information and Resources

Numerous resources for educators, policymakers, parents, and the public are made available by NWREL. These resources include events, such as conferences, workshops, and other activities; and products and publications, such as the Laboratory magazine and newsletters.

Services From Expert Staff

Our staff of more than 200 includes professional employees with doctorates from leading universities. Graduate majors include education, mathematics, science, business, languages, human development, journalism, library science, and foreign studies, among others.

Creating Communities
of Learning
&Excellence

Northwest Regional
Educational Laboratory